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ABSTRACT

Two studies are presented in which three fourth- or fifth-graders, assigned to five experimentally-created conditions which differed systematically in presence or absence of task-roles and group roles, were asked to cooperate in making a block-pattern on a round board. Behavior was pre-coded in various group-oriented and individual-oriented categories. A productivity index was constructed. In the first study of Facilitation of Cooperative Behavior, cooperative goal-structures alone did not maximize occurrence of cooperative behavior. Performance was poorest when instructions assigning task-requirements and social roles were absent. Pro-social behavior and performance were significantly greater where task-requirements, task-roles and group-roles were present together. In the second study-Critical Evaluations-different degrees of affect and helpfulness in evaluating the childrens' performance showed that criticisms, perceived as helpful and non-threatening, are related positively to achievement. Both studies explored patterns of sex differences and effects of socioeconomic variables. Recommendations are made for further research and for applications to teaching. (Author/SLD)

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THE EFFECTS OF INSTRUCTIONAL PRACTICES ON STUDENT LEARNING, EMOTIONAL GROWTH AND INTERPERSONAL RELATIONS: II. THE TEACHING AND LEARNING OF HELPING

September 1973

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U.S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE

Office of Education
National Center for Educational Research and Development

ABSTRACT

Two studies are presented in which groups of three fourth-or-fifth-graders were asked to cooperate in making a block-pattern on a round board. Behavior was pre-coded in various group-oriented and individual-oriented categories. A productivity index was constructed.

The Study of Facilitation of Cooperative Behavior assigned 76 groups to five experimentally-created conditions which differed systematically in presence or absence of task-roles and group-roles. As hypothesized, cooperative goal-structures alone did not maximize occurrence of cooperative behavior. Performance was poorest when instructions assigning task-requirements and social roles were absent. Pro-social behavior and performance was significantly greater where task-requirements, task-roles and group-roles were present together.

The study of Critical Evaluations assigned 70 groups to five experimentally created conditions which differed systematically in combinations of degree of affect and helpfulness expressed in critical evaluations of the childrens' performance by an adult Experimenter. The theory was supported predicting that criticisms, perceived as helpful and non-threatening, are related positively to achievement.

Both studies found consistent patterns of sex differences, boys showing greater independence from and/or resistance to experimental inductions, with predicted effects on performance. Both studies explored effects of socioeconomic variables. Recommendations are made for further research and for applications to teaching.

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PREFACE

This report is by its very nature not a mere summary of two research projects completed under a Regional Research Grant awarded to the author by the U.S. Department of Health, Education and Welfare. It represents thought which stands at the midpoint of five years devoted to development of theory and research concerned with social behaviors of elementary school children, with particular stress on competitive and cooperative work-relationships. The integration of fields germane to this area - child and adolescent development, psychology of social influence processes, sociology of the family, of the school and school-related institutions -- forms the central core of the philosophy of education fundamental to the Department of Education and Child Development at Bryn Mawr College. It is, therefore, a source of great satisfaction to me that most of the research has been carried out by graduate students in our Department, who have built on each others' contributions in successive years.

In the first of the series, Dr. Beth Hannah's dissertation study of achievement-related behaviors which was executed under a preceding HEW research grant, Nancy Torop and Jane Crawford served as interaction observers. Both of them, in conjunction with Carol Silberberg, continued their association with the two major studies performed under the present grant. This included giving final form to the task, to the interaction categories, and to a productivity index. Ms. Silberberg and Crawford acted as interaction observers in Ms. Torop's research on Effects of Critical Evaluations which constituted her Ph.D. dissertation and which is presented in condensed form in Chapter IV of this Report. Subsequently, Carol Silberberg created most sensitively the task-and-group-role variables as Experimenter in the Facilitation of Cooperation study presented in Chapter III. In that study, Jane Crawford acted again as interaction observer and data analyst. Dr. Torop continued to function in our program as consultant for the computer analysis in the latter project, as well as for the two ongoing Developmental studies of Cooperation and Competition. Both these studies, in two different socioeconomic school

settings, carried out under Eleanor Murdoch and Helen Loeb, respectively, are direct outgrowths of work completed under this grant. They extended the performance indices in important ways; one of Ms. Murdoch's observers, Bonnie McGonagle, prepared the comparative analysis of fourth graders' cooperation presented in Chapter V.

Indications of still further-reaching effects of the initial impetus to our research afforded by these two grants are presented in the Research Recommendations of Chapter VI.

I wish to express my appreciation to the members of my department, in particular the Chairman, Dr. Ethel Maw, and my colleagues, Dr. Faye Soffen, Director of the Graduate Counseling Program and Susan Maxfield, Director of the Phoebe Ann Thorne Nursery School, for their constant support and facilitation of my research activities.

We are grateful also to the staff of the Lower Merion School District, including in particular the Assistant Superintendent, Principals of five elementary schools, and many individual classroom teachers. By their ready understanding of our experimental needs they indeed made these studies possible.

Chapter I

Introduction

A. Overview of Research Program

The studies described in this report continue our program of inquiry into cooperative and competitive behaviors of elementary school children. The importance of both of these modes of social orientation for the life of developing children can hardly be exaggerated. Individualistic and competitive features of American society have been described and analyzed in great detail by vast numbers of social scientists. Similarly, the incredible complexities of twentieth century culture necessitating individual combination of forces in cooperative endeavors have been frequently examined. Opportunities for development of both of these social behaviors are provided in schools: occasions for competitive strife, in latent potentiality as well as behavioral manifestations, are rampant in the classroom; in fact, some educators consider competitve motivation as the most powerful dynamic in individual learning. And, the sheer number of pupils present in the classroom provides an ideal setting for cooperative pupil interaction, though the extent to which schools do or do not foster group activities is disputed. Powerful emotions are attached to either of these social behaviors by parents and schoolmen alike. It is all the more astonishing to find that so little is known with certainty about the effects of competitive and cooperative motivation in school children, although a plethora of polemic anecdotal reports does indeed exist. Even more difficult to believe is the fact that systematic studies of cooperative and competitive behaviors in elementary and secondary schools are virtually non-existent.

Development of a methodology for the study of cooperative and competitive behaviors appropriate for use in school settings was, therefore, a high priority in the first stage of our research. It became evident that observation of the extent to which these behaviors were manifested in classrooms was insufficient

for advancement of generalizable understandings in this area. The strategy eventually employed in all of our studies utilized a controlled field setting: three to five pre-selected children were taken out of their classroom at one time and brought into a spare room in the school to work together on a specified activity. Thus we were faced with two major types of methodological requirements: design of work-tasks in which pupils could be engaged under either cooperative or competitive working conditions, and, secondly, methodologies had to be devised for the observation and measurement of social interaction and performance. The present studies have built on these first procedures and have improved upon them considerably. Our methodology is detailed in Chapter II.

From the beginning, our research has been based on the assumption that exclusive theoretical and experimental juxtaposition of cooperation versus competition obscures important questions that should be asked separately about behavioral processes characteristic of each of these two situations (Pepitone,1969). Accordingly, the first series of studies was concerned with social behaviors in work-structures which give rise to competitive motivations (Pepitone,1971a,1972). They focused on interpupil comparison as a major determinant of competitive interactions. The first study investigated comparison behavior as a function of cognitive unclarity by varying the amount of information available to pupils working on task-assignments (Crawford, 1970). The second study examined comparison behavior as a function of the degree of similarity of activities assigned to the children (Hannah,1970). In a third study sex differences in comparison behavior, as well as in competence and confidence were explored (Pepitone, 1972).

The next steps in our research program called for exploration of social behaviors under cooperative working conditions (Pepitone, 1971a). This is the concern of the research presented in this report. Two major studies were carried out which were outgrowths of the research described above. In the course of exploring behavior under competitive conditions, it was frequently noted that even when fourth graders were given opportunities to work together, they did not take advantage of these possibilities. When some did decide to work together, they often found it difficult to do so. These observations, coupled with theoretical analyses of

classroom processes, determined the direction of our exploration of cooperative behaviors: elementary school children, we argued, must be taught to work together. Exploration of variables which would increase the need to cooperate led us to manipulation of various potential sources of member interdependence. Following the most influential theoretical analysis of behavior under cooperative conditions, (Deutsch, 1949), a common work-goal was identified as perhaps the most potent force toward cooperative pupil interaction. Additionally, however, we hypothesized that such behavior could be facilitated by assignment of specific roles to individual pupils. We stipulated further that these roles must be organically related to the requirements of the task. Accordingly, task-requirements were specified, both task-roles and group-roles were created systematically, and their effects on helpful social interaction as well as on performance were determined. This research is described in Chapter III.

In the studies executed under the first grant, comparison behavior had been analyzed into two components: attentional and evaluative. That is, it was assumed that individuals must be aware of, and attentive to each other, before they can engage in comparison with each other; and further, that whatever is noticed must be evaluated so that it can fulfill its function in the process of comparison. Piaget and others have pointed out the important role of cognitive attendance to others in a child's social development: analysis of these attentional variables is one of the central concerns in the studies in progress now which explore systematically developmental trends in cooperative and competitive behavior in elementary school children from two widely differing socioeconomic backgrounds (Loeb, 1973, Murdoch, 1973).

Our first studies have pointed to the importance of the evaluative component in comparison behavior in the process of competition. Next steps called for independent variation of evaluation behavior under cooperative working conditions, where we expected evaluations to function importantly both in the giving of help and in

the receiving of help. That is, the helper must evaluate the performance of the person to whom he is about to offer assistance, and the manner in which help is given is likely to play a crucial function in the way help is accepted. The manner in which evaluations were made thus emerged as a crucial independent variable. This area of inquiry seemed to be particularly relevant in consideration of teacher roles, as a great deal of a teacher's time must of necessity be spent evaluating pupil activities. Since there is considerable research evidence to the fact that teacher approval (i.e. positive evaluation) has generally beneficial effects on pupils, and since fewer and less conclusive studies exist of the effects of critical (i.e. negative) evaluations, the latter were selected for study. Our theoretical formulation consisted of a two-factor analysis which separated the affective component of criticism from an informational component (Torop, 1973). In a doctoral dissertation, these two dimensions were manipulated experimentally and their effects determined on pupil interaction, defensiveness, performance, and self-evaluation. Dr. Torop's condensed version of her thesis is presented in Chapter IV.

Most behavioral scientists would readily agree that the child's socio-economic background is likely to be a crucial variable in his skills and motives to cooperate. But the interrelationships are likely to be complex and difficult to isolate clearly. Indeed, what research there is in this area tends to be scanty and contradictory. Our suburban sample offered too little variability in socio-economic status of pupils to make analysis of this variable feasible in the manner originally planned (studying groups composed of pupils from high and low socio-economic backgrounds, respectively). Instead, we were able to examine intercorrelations between some of the pupils' personal background variables and their behaviors under cooperative working conditions. Further, we were able to compare fourth grade suburban pupils with lower working class fourth graders on the dimensions of cooperative interaction and performance (McGonigle, 1973), in connection with the two developmental studies mentioned above. These data are presented in Chapter V.

A concluding chapter discusses directions of research both on a general programatic level and with respect to some specific next steps following from the findings of, and questions raised by our studies. While we trust that our work will make some contribution to theoretical understanding of childrens' social behaviors in the classroom, we are also deeply concerned about some contemporary classroom practices. We therefore include some speculations about the implications of our work for classroom teaching. The relevance of our research is pointed out, as we see it, in relation both to the Open Classroom on the elementary level, and Alternative High Schools on the secondary level. In both cases, we suggest instructional practices which allow for student learning in cooperating work groups, thus providing structures which facilitate individual pupil cognitive growth as well as growth in social responsibility.

Bibliography of Research Program on Competition and Cooperation, 1968 - 1973

Pepitone, E. A. Comparison Behaviors in the classroom. Proposal for Research Submitted to the U.S. Commissioner of Education, 1969

Pepitone, E. A. The Effects of Instructional Practices on Student Learning, Emotional Growth and Interpersonal Relations: II. The Teaching and Learning of Helping Proposal for Research submitted to the U S. Commissioner of Education, April 1971a

Pepitone, E A. The Effects of Instructional Practices on Student Learning, Emotional Growth, and Interpersonal Relations: I. Comparison Behavior in the Classroom Final Report; July 1971b

Pepitone, E. A. Comparison Behavior In Elementary School Children, American Educational Research Journal, vol. 9, 1, January 1972

Pepitone, E. A. Facilitation of Cooperative Behavior in Elementary School Children; Paper read at American Educational Research Association Annual Meeting, March 1973

Crawford, J. Comparison behavior in the classroom: The role of informational and evaluative processes. Unpublished Master's thesis, Bryn Mawr College, 1970

Hannah, B. H. Cooperation and competition in the classroom: Effects of the degree of similarity of the task on the behavior in children's groups. Unpublished doctoral dissertation, Bryn Mawr College, 1970

Torop, N. The effects of adult evaluation on Elementary school children's work and social interaction: an experimental study of affective tone and helpfulness. Unpublished doctoral dissertation, Bryn Mawr College, 1973

McGonigle, B. Cooperative behavior and performance of fourth grade children from two different socio-economic backgrounds; Masters dissertation in progress, Bryn Mawr College, 1973

Loeb, H A developmental study of Cooperative and Competitive Behaviors of children in suburban elementary school; Ph.D. dissertation in progress, Bryn Mawr College, 1973

Murdoch, E. The effects of Competition and cooperation on lower-class white elementary school children: A developmental study; Ph.D dissertation in progress, Bryn Mawr College, 1973

Chapter II

METHODOLOGY

Our two methodological priorities included: 1. perfection of a work-task and development of criteria by which goodness of its performance could be measured; 2. improvement of categories of social behavior relevant to our theoretical expectations of its occurrence under conditions of cooperation and competition. The issues involved in these two areas, the problems encountered, and their final resolutions are presented in this chapter.

A. The Work Task

1. Requirements.

In the original formulation of our program, we listed eight requirements for specific characteristics of the task to be developed. (Pepitone, 1969). Their continued relevance four years later suggests the usefulness of their restatement at this point:

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a. A group activity which could be subdivided into several separate activities to be carried out by individual pupils.

b. It should be possible for one pupil to complete the whole group task by himself, as well as for two or more children to participate simultaneously working on various sub-activities.

c. It should be possible to create various degrees of interdependence among the separate activities, varying from complete independence (so that each child can carry out his task by himself) to interdependence such that each child could not complete his assignment without help from every other child.

d. It should be possible to vary the similarity of tasks by assigning identical activities to each child, as well as allowing each child to work on something entirely different from every other child.

e. It should be possible to vary the difficulty of the tasks so that they can be used with children throughout all elementary grades.

f. The tasks should bear some resemblance to schoolwork, but not require possession of special abilities, nor should children have previous experience with an identical activity.

g. The tasks should allow, during their performance, expression of any kind of social behavior; children should especially be afforded the opportunity to watch each other at work, to talk freely with each other should they wish to do so, or to remain silent, to help each other, to hinder each other, and so on.

h. The accomplishment of each child, as well as the goodness of the combined final group product, should be measurable in quantitative terms.

2. Description of Work-Task

To meet these requirements, the following task was designed and employed in the first stage of our research: A large circular "art puzzle" was designed, separable into pie-shaped parts. It was made of plasterboard, thirty-six inches in diameter. The puzzle pieces consisted of pre-cut cardboard, variously colored, which, when combined correctly, made an abstract flower design. The pieces were waxed on the backside to allow for shifting around until final placement allowed adherence by merely pressing them firmly into place. In the first series of studies, the art puzzle was divided into five separate parts, and each pupil was given one part to be worked upon. It was to be combined upon completion with the four other parts which were being executed simultaneously by four other Ss. Criteria a,b,f, and g could be satisfied by this device. In order to vary similarity and difficulty (criteria d and e), each group was presented at the beginning with a model: a picture of the completed final product. By varying the design of the model, level of difficulty could be manipulated. By varying the pieces provided for each S, the degree of similarity between the work of each S could be varied. Individual and/or group accomplishment could be scored by the time to completion as well as by the extent to which the S's or group's final product agreed with the model, thus satisfying requirement h.

While satisfactory for the exploratory stage of our research, the original work-task had several deficiencies which demanded improvement. Foremost among the weaknesses was the make-shift nature of the materials used. Consequently, the "Pep board" was designed: a circular board, 40" in diameter, made of ½" duraply, covered with a velvet-like substance. Commercially known as "Velcro." Instead of card-board pieces, Pattern-Blocks from Elementary Science Study, a product of McGraw Hill Co., were used. The set consists of 250 pieces, three-sixteenth inches thick, of various shapes, sizes and colors which can be combined in innumerable ways. A small piece of Velcro attached by us to the back of each block allows adhesion to the board; yet blocks can be easily lifted and placed into different positions on the board.

In the first-stage studies, five children were working on their own pie-shaped parts separately at seats arranged in a circle, and only combined their parts at the end of their work to give a final group product. The shift in emphasis to cooperation rather than competition demanded joint action rather than work on separate parts. Accordingly, children stood around the board which was placed on the table, with the box of pieces in the center, and a common product was demanded from the group right at the outset. Three thin, black ribbons emanating from the center can be fastened at the periphery to divide the board into three parts, should separate work be demanded. These ribbons are used when competitive conditions are created and Ss are called upon to work by themselves; under cooperative conditions, the separations are removed. We have also explored the feasibility of separating the Pep-board into several parts which may be joined or separated as necessary. This proved entirely successful, and opens up future use in investigations of performance as a function of spatial separation of group members, team cooperation or competition, etc. Completion of the present series of studies satisfied us that we had, in the Pep Board and Pattern Blocks, an instrument which was highly satisfactory as a means of creating either competitive or cooperative conditions.

3. Measurement of Performance.

A limitation of the earlier studies was use of the model as a criterion for evaluation of performance, as it restricted the group's product to imitation of a model. The present research has abandoned the model, and pupils are given freedom to make anything they wish. This widens enormously the range of group behaviors which may be studied by our methodology, as it may include factors such as creativity, inventiveness, group decision, etc., factors which were irrelevant when the goal of the group was that of copying a model. The final product is photographed with a polaroid camera, and scoring proceeds from the photograph. But how can performance be measured in the absence of a standard of correctness?

We have provided standards in several other ways. In the two major studies reported here, Ss were simply given verbally certain criteria for performance. In essence they were told "...you can make anything you want, but your picture must have a common theme, be unified, balanced and hang together...". Various indices were devised which allowed measurement of the extent to which these requirements were met. Additionally, indices of "elaborateness of design" and "complexity of theme" were explored, to give objective measures of quality of performance which would reflect aspects of the group's creativity and inventiveness.

Pictures of the final product of each group were scored independently by two judges. Ratings for each index were then compared. Differences were discussed until agreement was reached. Overall, there was an 80% agreement between the judges before resolution of differences. Overall impression was included as a possible index to determine if raters' impressionistic judgments without specific instructions would be as reliable as a scale which specified exact dimensions and criteria according to which ratings were to be made. They were not as reliable as there was only 67% agreement between the two raters in judgment of overall impression. However, it is important to note that the pooled ratings of overall impressions correlate significantly with each of the different indices.

Appendix A-1 presents the definitions and scoring system for the eleven different indices; Appendix A-2 presents intercorrelations of the indices.

Out of the 66 intercorrelations, almost 50% show highly significant relationships. Interestingly, the highest intercorrelations are obtained between the indices devised for the different requirements of unification, balance and commonality. Elaborateness is distinct from these indices, and quantity is also uncorrelated. In fact, quantity of performance is the only index that does not relate to any of the other qualitative indices other than elaborateness. The latter correlation would seem to add to the validity of our indices: for, almost by definition, more elaborate products would necessitate use of more pieces.

The conclusion, then, justified by these first explorations, would seem to be that quality of performance can be reliably and meaningfully scored by our scoring system. Additional corroboration of its validity was obtained from explorations of scores received by children classified as "emotionally disturbed", which were significantly lower on all qualitative indices.

It is envisaged that different concerns of different future studies in this area will make different types of indices appropriate. For instance, in the ongoing developmental studies mentioned in Chapter I, pupils from Kindergarten through fifth grade are asked to "make a big person", instead of following the requirements described previously. Requests for products which depict identical objects or have identical themes makes products more comparable and thus one would expect that scoring would be facilitated and scoring reliability increased. In the case of the request for a person, in a developmental study there is the added advantage that there are known developmental differences among children when asked to draw a person, and, what makes it still more advantageous, various scoring indices for such drawings are in existence (e.g. Koppitz, Goodenough). Murdoch and Loeb have adapted some of these indices in development of their own measures, which include: size of the person; sex-identity; movements; proportions among bodily parts;

details and elaborations of parts: number of parts; role-conceptions, and so forth. Even though not used in the two studies reported here, for those interested in this subsequent development of scoring indices, their system is included in Appendix A-3.

B. Social Interaction

1. Definition of Interaction Categories.

Each of our studies has employed the same set of precoded interaction categories modified in each case to observe in greatest detail those behaviors which were of concern to specific hypotheses generated by a given study. That is, we have devised a broad set of categories for observation of behaviors which characterize social interactions under both cooperative and competitive working conditions. These include a variety of Attentional Behaviors; a variety of Evaluative Behaviors; a variety of Helping Patterns; a variety of Hindering Patterns; as well as additional assortments of "positive" and "negative" social interactions. Then, categories were expanded for behaviors which were of paramount concern in a given study, while behaviors of lesser importance were combined rather than differentiated.

Thus, in the first studies concerned with conditions hypothesized to elicit comparison behaviors, detailed categories were provided for observation of both components - attentional behaviors and evaluational behaviors. Observers were asked to differentiate between verbal and non-verbal attending. Both attentional and evaluative acts were recorded with respect to their referent: own work, work of specified others in group, and the group product. Evaluations were distinguished in terms of their mode: - positive, neutral, negative - as well as their referent - self, specified others, group. Special attention was given to development of the category of Besting, as well as Raising own status, or Lowering status of others, as these constituted major behavioral evidence of competitive motivation. Definitions may be found in the various publications connected with the first grant.

With the study of cooperative conditions, the main concern of this report, major emphasis in observation shifted to pro-social behaviors. Pilot studies had fully supported our expectations that very little negative behavior in general, and Besting behavior in particular, would occur. To ease observer-load, behaviors associated with competitive motivation - attentional behaviors and besting primarily - were not recorded; however, the Experimenter was asked to note these down in her records as they occurred.

In the Critical Evaluation study, where evaluative behavior was varied independently, evaluative categories were expanded to include a variety of responses made to the Evaluator. These behaviors were recorded both by the Experimenter and an added process observer. In the Role Facilitation study, where evaluations were not created experimentally and where, in fact, every effort was made to create a non-evaluative climate in which cooperation would take place, very little evaluative comments were obtained and hence not recorded in finer detail. As will be seen in the Results section of that study, their low frequency, in fact, prevented their further analysis.

Definitions of observation categories employed in the two studies, with illustrative examples given to observers, are presented in Appendix B-1.

The most important innovation in behavioral observation was progress in our ability to describe the group's working pattern. How the children worked together seemed likely to be of crucial importance in work-situations which require joint group effort. Each of the studies advanced our methodology one step further. In the Critical Evaluation study, which was executed before the remaining two, the work-pattern was recorded simply in terms of the number of children who were working together at any one time. Three possibilities existed: three children, each working alone; two children working together and one alone; or three children working together. Each interaction-recording sheet was divided into three separate sections corresponding to these three possible work-patterns, and all

interactions were recorded in a given section determined by the ongoing working-pattern.

It was recognized that each of the children could be working by themselves, yet working on a part of the pattern which was needed by the group, and, reasoning analogously, that mere working on the same section did not necessarily signify a cooperative working pattern. Accordingly, observers in the Role Facilitation study, where the dynamics of work were of paramount concern, were given additional criteria which allowed them to record whether a child was working toward his own goal exclusively (i.e. working for self), or whether he was contributing to the group goal (i.e. works for group). This distinction proved to be most important and meaningful in analysis of the group's product as a function of particular role-interdependencies which we had attempted to create.

In the Developmental Studies which involved the Socio-economic comparisons reported in Chapter V, it was important to determine specific work-patterns which would disclose social skills in cooperation that might be characteristic at given age-levels. Accordingly, observers were asked to make additional judgments of the degree of coordination present among the two or three children who were working together. The Experimenter was asked to make a record whenever it was possible to state, according to agreed-upon criteria, which of the three children was directing the group's work and thus could be said to execute leadership functions.

The extent to which observers succeeded in utilizing this interaction-system is examined next.

2. The Observation Process and its Reliability

Two observers were responsible for recording interactions among all three children. During the experiment, each of the three children wore a large identifying number on a ribbon around his or her neck so that the behaviors could be coded according to initiator and recipient. Behavior was recorded at least once every fifteen seconds when the group was working with no verbal interaction at all. When verbal interaction occurred, continuous recording was employed.

The observers had been trained by the use of simulated groups, videotaped groups and pilot groups; as mentioned previously, some of the observers had had previous observational experiences in our research. They participated in the refinement and final formulation of the coding definitions. During the period of ongoing research, brief discussions were held between sessions to resolve any problems which had arisen in a given session.

Pearson product-moment coefficients of correlation were computed between amounts of behavior accorded by the observers into each category. Results are presented in Table I. Unless otherwise indicated, data presented in this chapter are based on the Critical Evaluation study only, in order to avoid duplication of data from the Facilitation Study, with which they are in agreement in all major respects discussed.

For clarity of presentation, some of the separate categories are combined into larger units and presented in Table I.

TABLE I

Inter-Observer Reliability for Grouped Behavior Categories

Grouped Categories	Product-moment-correlations
Total Interactions	.93
Places Pieces for Self	.94
Places Pieces for Group	.93
Total Evaluations	.85
Helps	.83
Requests Help or Information	.82
Accepts Help and Suggestions	.83
Ignores Help and Suggestions	.63
Positive Social Behavior	.90
Negative Social Behavior	.89
Avoids Task	.74

It may be seen that eight out of the ten categories have correlation coefficients of .80 or higher; the correlation for total interactions is .93. In general, the greater the amount of behavior recorded in a given category, the greater the observer-agreement. For instance, more than half of all recorded behavior consisted of working with pieces either for self or for the group. Here there is almost complete observer agreement. Help offered was practically never ignored; it is the lowest category of agreement between observers (.63), as, of course, slight observer deviations are accorded disproportionate weights in the final index.

It may be concluded that behavior was observed with a high degree of reliability.

3. Intercorrelations Among Interaction Categories

Intercorrelations among the grouped behavior categories are presented in Table II. It is evident that almost 50% of the correlations show significant relationships. Two general patterns among the correlation indices should be noticed: first, the consistently significantly negative relations between the Works Only category and each of the interaction categories. These relationships merely disclose the internal consistency of our observation data: the Works Only category is defined as working with pieces without verbal interaction and thus, by definition, such silent work-patterns must be negatively related to verbal interaction. (The correlations are not perfect due to observer convention which permitted double coding when the work-pattern of the group was primarily non-verbal, interspersed with an occasional sparse remark from one S).

Secondly, one must notice the significant relationships between total amount of interaction and each of the behavior categories. That is, the highly active participant tends to be high in all types of social interaction. This is a finding that has been frequently obtained in other studies of group interaction, including that of adult discussion groups (for instance in the 1948 and 1949 National

TABLE II

Intercorrelations Of Grouped Behavior Categories

	Total Inter-action	Pos Eval	Neg Eval	Neut Eval	Total Eval	Self Eval	Other Eval	Group Eval
Works Only	-.68*	-.28*	-.38*	-.12	-.41*	-.25*	-.30*	-.30*
Total Int		.50*	.50*	.13	.62*	.33*	.50*	.45*
Pos Eval			.32*	.07	.81*	.41*	.82*	.30*
Neg Eval				.15	.80*	.77*	.51*	.29*
Neut Eval					.28*	.25*	.15	.20
Total Eval						.73*	.82*	.39*
Self Eval							.38*	.01
Other Eval								.06
Group Eval								
Req Help								
Helping								
Acc Help								
Ignores								
Rej Help								
+ Soc Beh								
- Soc Beh								
Avoid Task								

TABLE II -- Continued

Req Help	Helping	Accepts Help	Ignores	Rejects Help	Pos Soc Beh	Neg Soc Beh	Avoids Task	Common Work Pattern
-.41*	-.41*	-.31*	-.26*	-.46*	-.48*	-.55*	-.20	-.45*
.40*	.74*	.48*	.22*	.60*	.83*	.71*	.06	.46*
.15	.31*	.08	.05	.19	.48*	.27*	.04	.06
.36*	.14	-.06	.03	.22	.14	.67*	.20	.14
.04	.05	-.02	.02	.12	.04	.17	-.03	.17
.31*	.28*	.01	.05	.26*	.38*	.58*	.14	.14
.33*	.04	-.20	-.01	.08	.03	.45*	.18	0
.27*	.23*	.05	-.03	.19	.37*	.38*	.06	.04
.06	.34*	.24*	.22*	.32*	.40*	.36*	.02	.36*
	.16	-.03	-.08	.11	.13	.21	.30*	.04
		.30*	-.01	.34*	.87*	.24*	-.13	.38*
			.19	.30*	.68*	.11	-.20	.49*
				.25*	.09	.38*	-.01	.20
					.41*	.65*	.07	.34*
						.27*	.17	.49*
							.22	.26*
								-.05

*Significant Result

Training Laboratory discussion groups, data analysis of which was directed by this writer). The high correlation of individual categories with level of interaction would seem to preclude further interpretation of individual intercorrelations of this matrix.

Where causal analysis of social interaction is of interest, we conclude that it is necessary to introduce systematically independent variations of certain behaviors into groups and to observe responses to these behavioral stimuli. This is indeed precisely the approach taken in the design of the Critical Evaluation study, where critical evaluative statements were introjected systematically by an adult evaluator. In that study, rejection of the evaluator's criticism was related to negative social behaviors of group members ($r = .46$), and member defensiveness, hostility and confusion were all related to negative social behaviors. Here, the inference is justified that critical evaluations caused the increase in negative interpersonal behaviors.

C. Relations between Social Interactions and Productivity

Consideration of these relationships goes beyond mere concern with methodological issues; they are as well of obvious theoretical interest to our investigations. The relationships are examined in this chapter for their implications for the validity of the Interaction Category System, as well as the validity of the Productivity Indices.

Intercorrelations between behavior categories and productivity indices are presented in Table III. Perhaps among the most important findings are correlations which show that total amount of interaction bears no relationship to quality of performance and that, in fact, none of the separate behavior categories bear a relationship to the overall group score, to quality of performance, or to raters' overall impressions of performance. On the other hand, specific behaviors were related to specific subscores of the productivity index. In particular, working together, helping, accepting help, and total positive social behaviors were

TABLE III

Correlations Between Grouped Behavior Categories And Productivity

	Overall Impress	Elaborateness	Distinct Theme	Common Parts	Unification	Balance Design	Balance Board	Quality	Quantity	Group Score	Agreement	Concept Theme
Works Only	.07	.25*	-.13	-.11	-.03	-.22	-.09	-.01	.39*	.06	-.31*	-.19
Total Int	-.07	-.26*	.06	.23*	.14	.15	.09	0	-.37*	.01	.37*	.24*
Pos Eval	-.06	-.18	-.05	-.03	-.08	-.11	-.03	-.02	-.13	-.11	.16	.15
Neg Eval	-.03	-.14	.08	.02	-.10	.04	.07	.10	-.18	-.02	.06	-.04
Neut Eval	-.08	-.01	-.04	-.02	-.17	.03	.03	.03	-.20	-.08	.09	-.01
Total Eval	-.07	-.20	.01	-.01	-.14	-.04	.02	.05	-.22	-.10	.15	.07
Self Eval	-.04	.11	-.04	-.12	-.14	.07	.07	.10	-.12	-.08	-.08	.14
Other Eval	.02	-.11	.02	.01	-.06	-.02	0	.07	-.16	-.04	.19	.20
Group Eval	-.17	-.22	.04	-.13	-.09	-.17	-.03	.12	.16	-.08	.20	.05
Plcs Pc Sf	-.09	.12	-.19	-.45*	-.21	.15	-.03	-.09	.16	-.18	-.61*	-.54*
Plcs PcGr	.16	.05	.12	.41*	.22	0	0	.09	.14	.26*	.44*	.46*

TABLE III -- Continued

Req Help	.14	.06	.17	-.06	-.09	.10	.08	.24*	-.24*	.02	.14	.17
Helping	-.04	-.15	.02	.23*	.24*	-.12	.06	-.03	-.21	.07	.25*	.20
Acc Help	-.11	.22	-.08	.33*	.29*	-.17	.01	-.11	.26*	.04	.30*	.21
Ignores	-.21	-.26*	-.06	-.02	.01	-.27*	.01	.15	.16	-.12	.07	-.01
Rej Help	-.12	-.20	.07	.08	.03	-.16	-.01	0	-.29*	-.09	.26*	.10
+ Soc Beh	-.09	-.25*	-.04	.30*	.27*	-.18	.04	.08	-.29*	.04	.34*	.27*
- Soc Beh	-.07	-.21	.10	-.11	-.02	-.09	.08	.01	-.26*	-.03	.21	.06
Avoid Task	.01	.02	0	-.17	-.24*	.05	-.01	.13	-.18	-.18	.03	-.04
Com Work Pattern	-.38*	-.36*	.20	.16	.04	-.39*	-.16	-.29*	.19	.20	.29*	.01

*Significant Result

positively related to commonality, unification and agreement on theme. These indices are precisely those which define the requirements for performance of the task as given out in experimental instructions.

It would thus appear that positive social interaction helped the children to fulfill the task with which they were charged. Along the same lines, it is noteworthy that the only category of social behavior related to conception of theme is that of positive social interaction. Similarly, placing pieces for self was negatively related to commonality ($r = -.45$), agreement on theme ($r = -.61$) and conception of theme ($r = -.54$). Placing pieces for the group, however, was positively related to the same three subscores ($r = .41$; .44 and. 46, respectively).

The validity of our scoring system is strengthened by these findings as well, for we may conclude that expected subindices do relate meaningfully to expected social behaviors. It is also striking that total social interaction correlates negatively with quantity of performance. It suggests that increased social interaction enabled the children to focus successfully on the task-requirements, while absence of such interaction was associated with arbitrary individual amassing of pieces at the expense of goodness of group product. These patterns of relationships present a convincing case for the conclusion that working together indeed facilitated the childrens' performance. These findings will be examined in the light of additional data in the theoretical framework presented in subsequent chapters.

D. Experimental Creation of Independent Variables

We consider one of the major methodological contributions of our studies demonstration that investigations with highly controlled experimental designs can be carried out within school settings. Our studies are "controlled field studies"; they are "field studies" in the sense that they are carried on within an ongoing school setting; they are "controlled" in the sense that they follow a predetermined design which controls major variables while experimental variables are introduced much in the manner of social psychologists in their laboratory settings.

While greater expenditure of effort, time and sensitivity is needed to make necessary arrangements, it can be done: Superintendents and Principals were willing to help in setting up experimental mechanics; overcrowded schools were able to produce a room where research could proceed undisturbed; teachers were willing to have their classes interrupted and to release three children at a time, of our own choosing. A sample of written Explanations of Research Project to School Personnel is included in Appendix C-1.

Compromises were inevitable; obviously, our schedules had to adapt to school hours, assemblies, trips, etc. In the Philadelphia School LM, the extensive teacher strike precluded intelligence testing for this year. Some suburban school policies prevented our access to pupil files. Chapter V discusses analyses involving pupils' personal background variables that were affected by such factors. However, in no case did we have to modify experimental procedures which were concerned with creation of independent variables.

Procedures used in the two main studies will now be outlined. In both studies, E followed a prepared script, memorized to give instructions. It is included in Appendix C-2. The instructions were intended to fulfill the following objectives:

a. standardization of procedures to insure maximum experimental control;

b. to create a group goal;

c. to create interdependence among Ss;

d. To create a positive work-atmospher;

e. to remove ordinary classroom restraints against talking and helping one another;

f. to set up requirements for the task which could be exploited in the experimental conditions;

g. to familiarize Ss with materials.

1. Creation of Task-Requirements, Task-Roles and Group-Roles

In the Role Facilitation Study, five conditions were created:

The Unstructured Condition. Here, Ss were simply told to begin working upon completion of the General Instructions. (See Appendix C-2). No mention of task-requirements was made.

The Task Requirement Condition. (See Appendix C-3). Ss were informed of three requirements necessary for the final group product: the product must be one big, whole picture; secondly, it must be balanced; thirdly, it must be unified.

In each case, E probed to make sure that each child understood what was required. E did not allow the group to start until she was satisfied that each child comprehended instructions.

These task-requirements were introduced also, in the same manner, in the three remaining conditions which had additional instructions as well.

The Task Role Condition. (See Appendix C-4)

Here, each S was given the role of being responsible for seeing that one of the requirements was fulfilled. Identical instructions were given as in the task-requirement condition: however, after Ss had become acquainted with the work for 90 seconds, they were interrupted and E proceeded with role assignments, as specified in Appendix C-4. #1 was always made the Designer: #2 the Balancer, and #3 the Unifier.

To assure that results in this condition could not be ascribed to the ninety-second interruption, Ss in all conditions were also interrupted at this point, and instructions repeated.

The Group Role Condition (See Appendix C-5)

Creation of Group Roles required perhaps the greatest skill on the part of E. As may be seen from the Instructions, E's aim was to create an understanding in each pupil about some group procedures that would lead to superior performance. Leading a five-to-ten-minutes' discussion among the three pupils, E made sure to

elicit from Ss the following group-process requirements:

communication must take place;

ideas must be shared;

exchange; give-and-take of opinions must happen.

It was felt that to require group-role-specialization, analogous to the required separation of functions in the task role condition, would become too confusing to Ss. And, indeed, pilot studies confirmed this. In this first and largely exploratory study of role facilitation, therefore, it was decided to aim simply for a heightened sensitivity to group process in the group role condition, and to teach some rudimentary skills of group interaction.

In a fifth condition, instructions for Task Roles and Group Roles were combined. Pilot studies helped to find a level where the Instructions could be comprehended and absorbed, without being too burdensome. We would have preferred a more leisurly pace in this, more complex, condition, but decided against it for control purposes to allow for comparability with the other conditions. Still, it is true that the experimenter had increasingly more contact with Ss, beginning with the Unstructured Condition and ending with the Task Role, Group Role combined condition. In this sense, one could claim that our variable was confounded. Still, one would have to explain how this confounding would account for the particular results reported in Chapter III.

2. Creation of Critical Evaluations

In the description of relationships among social interactions, the necessity was demonstrated for independent variation of important social behaviors. Evaluation was considered to be such a variable. The original plan proposed to build evaluation variables into the Role Facilitation study. As methodological explorations proceeded, it became evident that complexities involved in establishment of the latter variable would be confounded by further addition of evaluation. As duscussed in the previous chapter, theoretical analysis led to selection of

the dimension of criticalness of evaluation, and variations in its strenght, as well as in degree of helpfulness.

The following considerations were involved in creation of this experimental variable: Above all, our concern was with the psychological effects of critical comments on our young subjects. While we wanted critical comments to have an impact, obviously we wanted to leave no lasting effects on their self-evaluations. The decision was made, therefore, to address criticisms to each group as an entity, rather than to individual pupils within the group as originally planned. This meant that variations along the dimension of personal-impersonalness also had to be abandoned.

The degree of criticalness was determined in pilot studies. We were astounded at the impact of what we had considered a relatively mild comment such as "that's not too good"; children obviously were affected, in several cases removing everyone of the pieces which had made up their design, to start de nuovo after the criticism. Therefore, comments which had been intended for a Mild Critical Condition, were shifted to constitute a Strong Condition.

The two degrees of criticism consisted of six critical comments each, administed by E at roughly two minutes' intervals:

Mild Condition - Comments:

1. It's O.K.
2. That's not too bad
3. It could be better
4. Well, it's all right
5. That's not too bad
6. I guess that will have to do

Strong Condition - Comments:

1. You didn't get off to a very good start
2. That's not too good

3. You're not doing very well

4. That isn't very interesting

5. Is this the best you can do?

6. That's still not too good

We were much encouraged by members of the school personnel who were eager that the study be carried out, assuring us that pupils received much stronger negative evaluations from some classroom teachers. Still, every precaution was taken to protect potentially vulnerable children. All children who had been evaluated psychologically at any time in their school history, or who scored extremely low on the Coopersmith Self-Inventory were eliminated from the experimental sample. However, all the children who had been screened in this fashion were also given an opportunity to do the task in order that they would not feel left out.

Evaluations were made by the Experimenter, rather than peers, as originally intended. Greater control over precise expression of this variable was obtained, as well as simulating likely teacher-effects. E had completed her training as a School Counselor, and, while completing her dissertation, served as Educational Consultant for the Counseling Service Project, School District of Philadelphia. Each of the observers were, at the time, graduate students in the Bryn Mawr College School Counselor Program. Together they constituted a team, highly atuned to emotional needs of pupils as well as to experimental needs for precision of execution.

At the completion of each experimental session, children were shown the photograph of their group and its product (which served later as the basis of productivity measurement); their final performance was praised. Brief post-experimental interviews were held with each pupil to determine a variety of reactions for experimental purposes, as well as to make certain that no residue of the critical evaluations remained. In all cases pupils returned to their classes

in good spirits; throughout the study only genuine interest was encountered from teachers, no complaints from any source reached us directly or indirectly.

The study called for creation of Helpful Comments as well. Eight suggestions were made by E, variously paired as demanded by the design. The suggestions could be said to be objectively helpful, because they reminded the Ss of the task-requirements set down in the instructions. Following E's suggestions would indeed aid their work.

The Helpful Comments were as follows:

1. Remember, you can make lots of different things with these blocks, like flowers, people, cars, trains, or just pretty designs.
2. Why don't you spend some time deciding what your whole design is going to be?
3. Remember, you want your design to be well-balanced.
4. Why don't you try doing something to pull the whole design together, like making a border?
5. Don't forget that you are going to want to end up with one big picture, not three separate ones.
6. You don't want to have too much empty space left on the board.
7. The more things you add to the design, the more interesting it will be.
8. Your parts should all go together in some way.

The comments were designed to be neutral and non-critical. They had to be adjusted by E to the actual work of each group. Thus, if one group was still deciding what to do, comment #2 was omitted; if a border was being made, comment #4 was discarded as irrelevant, etc. As in the Role Facilitation study, here too sensitivity, skill and quick judgments were demanded of E. She was to use at least six of the eight comments, and, if appropriate, could repeat a comment. The observers were instructed to make sure that E remain "in role" throughout the duration of the investigation. Their reports, as well as periodic spot-checks by the dissertation supervisor found that E's behavior had become wholly standardized, so that she acted indeed as an invariant independent stimulus.

Chapter IV discusses the experimental design and results of the study.

PATTERNS OF INTERDEPENDENCE IN COOPERATIVE WORK OF ELEMENTARY SCHOOL CHILDREN

During the past half century, various social critics of American education have condemned schools for their relative unconcern with satisfaction of individual learners' personal needs. Others have been equally vocal in complaining about the schools' allegedly excessive emphasis on the individual. Still others opined that training for independence and individuality is sacrificed to classroom demands for conformity. And, there are also demands on schools to train its pupils in skills needed in a participatory democracy.

It stands to reason that, in order to function adequately in a society as complex as ours, individuals need to receive training for both independence and interdependence. Anecdotal reports of classroom atmospheres suggest that, by and large, they mirror our national individualistic ethos (Henry, 1957; Jackson, 1968; Bronfenbrenner, 1970). Training for interdependence is conspicuously absent in most schools and research in this area is similarly sparse and sporadic. Even though there is a substantial body of literature on group processes, it is seldom applied to the analysis of pupil performance. A recent review accounts for this state of affairs in a trenchant analysis of relationships between the field of Social Psychology and Education (Charters, 1973). The present investigation uses social psychological concepts in analysis of social processes among pupils engaged in a cooperative task. It explored several ways of increasing interdependence among participants. Secondly, it determined the effects of such conditions on pupil performance.

Evaluation of Research on Cooperation

Social psychological research in the area of cooperation has been greatly influenced by the conceptualization of Morton Deutsch (1949). His theoretical analysis focuses on individual goal-relationships: mutually exclusive in competition, shared in cooperation. Most subsequent research has been concerned with determining goodness of performance under these two contrasting goal-structures, perhaps at the expense of neglecting some of the important problems inherent in competition as well as cooperation. Our program of research is based on the assumption that theoretical and experimental juxtaposition of cooperation and competition obscures important questions that should be asked about each process separately (Pepitone, 1969). Our first series of studies focused on conditions that stimulated competitive behaviors among elementary school children (Pepitone, 1972). The present study creates experimentally several conditions assumed to facilitate occurrence of cooperative behaviors.

The Deutsch conceptualization may be taken to imply that mere provision of a work-situation in which shared aims are likely to exist will produce cooperative group interaction toward the shared goals. In fact, employment of the "project method" in educational settings may rest on precisely such a belief in goal-commonality as a sufficient condition for cooperation. An early exploratory study of elementary school children (Stendler, Damrin, Haines, 1951) casts doubt on such an assumption: given a common goal with the task to paint a mural, some pupils withdrew, others only helped best friends, while still others did the lions share of the work for the group, but worked by themselves. A recent study in our program demonstrated that, even in a work-situation where a strong group goal

exists, third graders will compete with each other, depending on the similarity of their task-assignments (Hannah, 1970).

Current research is beginning to concern itself with more precise analysis of variables within either competitive or cooperative goal structure situations. It is noteworthy that most of these investigations approach their problem by considering the task-structures involved. For instance, competitive motivation is examined as a function of complexity of task (Gifford, 1972). In cooperative conditions, such task-analysis poses additional problems which stem from the goup processes which occur when several individuals are working on a common task. A recent review categorizes cooperative tasks into those that require as outcomes a common product vs. those that allow for cooperative interaction but demand individual final products (Thompson, 1972). Only a few investigations could be located by the reviewer in which it was possible to categorize tasks in this manner, and these were field studies in relatively uncontrolled educational settings. They proved inconclusive, partly because as Thompson points out, no records were kept of the extent to which pupil interaction actually took place. Still another series of studies employed tasks that could be manipulated to favor either cooperative or competitive goal-structures among two participants, but concern here centered on existence of cooperative or competitive motivation as inferred from a single act of string-pulling (Madsen, 1971). Again, no data were obtained on social processes involved. The most relevant information about social interaction may still be found in the early studies which contract cooperation and competition; they generally conclude that interaction under cooperative goal-structures is more friendly, while under competitive goal-structures

interpersonal hostilities are more frequent (e.g. Deutsch, 1949, Hammond and Goldman, 1961). No single generalization can be made about goodness of performance under these two contrasting conditions, because outcomes seem to be partly a function of the specific nature of work-tasks.

Theoretical Analysis of Varieties of Interdependence in Cooperation

The research reviewed above suggests that progress in understanding relationships between cooperation and performance could lie in the direction of more detailed examination of member interaction during work on specific tasks. The unique aspect of cooperation would seem to be the fact that members must engage in interactions with each other, and that a large proportion of such interactions must be specifically work-related. It follows that members in a cooperative work-situation depend on each others' actions for their success. Conceptually, this is to say that what defines cooperative situations is the particular interdependencies among members. It is, then to the nature of these interdependencies that one must turn for theoretical understandings of processes involved in cooperation.

Deutsch derived hypotheses which predicted specific member behaviors under cooperative conditions from his basis assumption that such conditions create member-interdependence which stems from a goal-structure which is shared by, or held in common with, other members of a group. He also states that interdependence among group-members may arise from sources other than the group goal. This author has extended Deutsch's analysis by selecting the work-task itself as a second source of interdependence of members (Pepitone, 1952). In that early study, performance of college students was investigated under conditions which systematically varied the degree

to which each group member perceived her task as being important to the group. Two criteria were used in defining importance: 1. a criterion of non-substitutability: important acts were defined as those which must be performed in order for the group to succeed, while completely unimportant acts denoted those activities which need not be performed and which hence are completely substitutable; 2. a criterion of contribution to the goal referred to the extent to which progress toward the goal is made possible by performance of the task. By these two criteria, the most important activities needed by a group are those that are essential for the group's success, and performance of which advances the group considerably toward its goal. Evidence was obtained that under conditions of cooperation and differential task-assignments to members, perception of importance of task-assignment increases member-motivation and improves both the quality and quantity of performance. This motive-force was defined as a "sense of responsibility to the group".

The concept of member task-interdependence was developed further in a subsequent study of young female workers in a factory setting (Thomas, 1957). Here, Thomas made members interdependent by dividing labor among them while they performed tasks such that each person's performance served as a means for the performance of tasks by others. In other groups, members were linked together in interdependence only by a common team goal. Theoretical analysis of performance assumed that such division of labor creates member-expectations that others will perform their roles. As in the previous study, such role-expectations, derived from the task, were presumed to heighten motivation in each individual by creating a sense of responsibility to the group.

Summarizing, we may state that member-interdependence in work-groups may be created in the following ways: a) provision of a common goal; b) perception that certain important tasks must be performed in order for the group to succeed (henceforth referred to as task-requiredness); c) division of labor such that each member is expected to perform specified work which facilitates performance for other members (henceforth referred to as task-roles). The present study explores childrens' performance under these conditions of interdependence. It extends the concept of role-interdependence by adopting the commonly made distinction between member roles which stem from specific work-requirements of the group - task-roles - and those behaviors having to do with the process of working together - group roles (Bales, 1958). It stands to reason that performance of tasks under cooperative conditions would require, or at least benefit by, performance of specific group roles -- for instance, those concerned with eliciting member participation, coordinating diverse member activities, facilitating communication, giving help to needful members, and so forth. We thus assume that yet another way of creating member interdependence is through d) performance of group-roles.

The study which follows created different patterns of member-interdependence based on the four different sources listed above. In each case it was assumed that such interdependence would heighten motivation of members. Further, that if these motivations could be translated into responsible member interactions, the outcome, that is the group's final product, would be affected. Predictions about differential strengths of the hypothesized motives could at this

stage be only speculative. As all groups were presented common work-tasks, members in all conditions were working under conditions of goal-interdependence. And, as all research on cooperation shows, this source of interdependence has powerful effects on member-interaction. Thus, predominantly positive social behaviors were expected under all conditions. Addition of task-requirements was expected to improve performance because the requirements gave members both increased knowledge about the work, and also because requirements were presumed to raise the perceived importance of a task. Two conditions explored the respective effects of task-role assignment and group-role assignment. While there was no basis for differential predictions, performance of both roles may be deemed essential according to the two stated criteria of importance for the group's success. It would follow that a condition which creates member interdependence from the combined sources of group-goal, task-requirements, task-roles and group-roles would show most responsible group interaction and superior performance.

EXPERIMENTAL PROCEDURES AND DESIGN

Procedures and Design

In all major respects, the experimental procedures were identical with those used in our previous studies: groups of three fourth—or fifth-graders were selected at random from a given classroom, taken one group at a time to an unused classroom in the school, and asked to work together on a problem which requires cooperative action for its completion. Group performance measures were obtained and related to the group's social interaction which had been recorded by an observer-pair in pre-coded categories.

Subjects

The sample of 228 Ss was made up of predominantly middle and upper-middle class, white, fourth-and-fifth grade boys and girls from four elementary schools within one suburban school district. Since there were no systematic differences in pupil performance and behavior as a function of school or classroom treatment, data from all schools were combined. Since our previous investigations showed significant sex differences in behavior relevant to the present study, groups were composed of like-sexed Ss and treated separately in the data analysis.

The Work-Situation

The Work-Task consisted of two parts:

a. The Pep Board - a custom-made fourty inch circle of 1/2 inch Duraply, covered with a velvety material, on which a black line indicated separations into pie-shaped thirds:

b. Pattern-blocks from Elementary Science Study Program produced by McGraw Hill & Company. These are 250 variously shaped and colored flat blocks adapted by us so that each piece can adhere firmly to the board, yet is easily removable and placed into different positions.

Each group of three children was brought from the classroom into the experimental room. After the initial instructions were given, Ss assembled around the Pep board where the materials were demonstrated. This was followed by differential instructions given to create the experimental conditions.

The children were allowed to move about freely, to converse with each other, in short to interact with each other without any restriction in order to remove the restraints which usually exist in the classroom against displaying other-oriented behaviors. Ss were allowed fifteen minutes maximally to work on their task.

The completed pattern was then photographed with a Polaroid camera and immediately shown to the children. This served as a reward for the Ss who were praised for their performance and then dismissed. More importantly, this photograph allowed calculation of the group's productivity.

The Measurement of Productivity

Blind ratings were made by two independent judges who scored the quality of the group product along several predetermined dimensions. Each separate subscore was based on one specific task-requirement which had been detailed to the Ss in the procedural instructions. Specific ratings were made along the following dimensions: elaborateness of design; distinctness of theme; commonality of theme;

unification of pattern; balance of pattern, carefulness of execution. The sum of these ratings constituted the overall qualitative index. Agreement among the two raters for each subscore averaged 86%; these differences deviated no more than two points for a given rating and were adjusted by mutual agreement. The range of the total qualitative score could vary from 0 to a maximum of 24. The quantity of work was determined by counting the number of pieces used in the total pattern, 250 being the maximum score possible.

Behavior Observations

A record of the group's work-pattern was kept by the two observers in terms of each S's interrelationship with each of the other two Ss. This was recorded in two mutually exclusive categories: "works for self" and "works for others". The former category was checked whenever S worked by himself with no regard for the work of the other two Ss. By contract, "Works for others" was scored whenever S either worked with another S on the same pattern-part, or worked by himself but did so with his partner's advice and/or consent in order to contribute to the overall pattern. Additionally, the interaction observer recorded the group process into 28 precoded categories. Reliability, determined by Pearson correlations between different observers in previous studies, ranged for the same categories from .79 to .93.

The single categories could be grouped into three major types of behavior: Evaluative behaviors included evaluations of self, others, or of aspects of the product. Negative social behaviors consisted of such behavior as hindering, expressing aggression, ignoring, refusing to help or rejecting help when offered, etc.

Positive social behaviors focused especially on interpersonal helping behaviors which could be either non-verbal as in the manipulation of pieces for another S, and verbal such as making suggestions or offering assistance.

The Experimental Conditions

The experimental variations were created at the beginning of the session in a brief group discussion with E. In all conditions E sat in a small circle with the three Ss, and explained the nature of the work. Ss were asked to "make a big picture together with these block pieces on the board."

The Unstructured Condition served as the basic control condition: no task-requirements were introduced. In fact, to counter possible implications that E harbored expectations in regard to Ss' performance, Ss were told explicitly that they could make anything they wanted, go about working any way they wanted. The only interdependence created was that of a common goal -- "a big picture."

In the Task-Requirements Condition, E introduced additional information about task-requirements. The picture, she explained, needed to have some overall plan and design. Secondly, it needed to be balanced, and thirdly, it needed to be unified. Ss were engaged in conversation for five to ten minutes enlarging upon these requirements, making sure that they were understood.

In the Task-Role Condition, Ss were similarly informed about the requirements of the tasks. In addition, E explained that the group "might find it easier" if each S were responsible for one specific task-requirement, whereupon each S was assigned one of the three task-roles: The Designer, the Balancer, and the Unifier, respectively.

That is, exactly the same requirements were laid down as in the Task-Requirement Condition, only this time each of the members was made responsible for executing one of the requirements. To assure that the nature of each role was understood, each S was asked to describe his or her role-assignment to the group before proceeding to work together. If requirements were not understood E clarified confusions until each S was clearly aware of the activities involved in his/her task.

In the Group-Role Condition, task-requirements were also discussed as in the two task-conditions. But, in addition, E elicited discussion about group-process requirements. Posing questions pertaining to differences between solitary work and group work, E led the discussion to include considerations of interdependence and benefits accrueing from sharing of ideas. The prepared script questioned whether working alone or in a group might produce superior results, and brought out the point that group performance depended on interpersonal communication. Inferences were then made to behavioral proscriptions for the work-session which was about to begin, focused on listening to others as well as on contributing own ideas.

In a fifth condition, conditions III and IV were combined so that each S was given one specific task-role and a general group-role.

Groups were terminated after maximally fifteen minutes' work, the product was photographed, and each S interviewed for a few minutes about his attitude toward a variety of features of the experimental session. Attitudinal scales were presented to each S, and his ratings established with the help of E or the observer.

A summary of the salient characteristics of the five conditions, and of the number of boys' and girls' groups assigned to each condition, is presented in Table I.

Data Analysis

Data were treated in a two-way analysis of variance, so that effects of Sex as well as Condition could be examined for each variable.

TABLE I.

Summary Description of Five Conditions of Cooperation

Condition	Description	Groups N Boys	N Girls	
I Unstructured	Coop Work Structure, Common goal No task-requirements No differentiated task-roles No group roles	6	8	
II Task-Requirements	Coop Work Structure, Common goal Task-Requirements No differentiated task-roles No group roles	7	9	
III Task-Roles	Coop Work Structure, Common goal Task-Requirements Differentiated task-roles No group roles	7	8	
IV Group Roles	Coop Work Structure, Common goal Task-Requirements No differentiated task-roles Group roles	8	8	
V Task Roles + Group Roles	Coop Work Structure, Common goal Task-Requirements Differentiated task-roles Group roles	7	8	
	Total N Groups	35	41	76
	Total N SS	105	123	228

Table II presents the main results of a two-way analysis of variance, comparing mean behavior and performance in the five conditions separately for boys and girls. Mean amounts of all recorded behavior are indicated, subdivided into Social Interactions and Work manipulating pieces. The Work category is subdivided further into the previously-described work-patterns of special interest: Works for Self and Works for Group. Negative Social Behaviors -- Hindering, Aggression, Rejecting, Ignoring -- were virtually absent, as were behaviors characterizing Interpersonal Competition and Evaluations of all kinds. For clarity of presentation, they are omitted from Table II, as is a variety of positive social behaviors which did not differ across conditions. Behavior falling into the category of Helping is shown as an example of the characteristic trend of pro-social patterns in interdependent work.

Performance data are given in Table II in form of mean quality, mean quantity, and the various sub-indices derived from task-requirements.

Table III presents tests of significance for total work-activity for the two major work-patterns and for the two major performance-indices derived from one-way analyses of variance carried out separately for boys and girls, showing all comparisons between conditions which reached statistical significance. For each of the five measures, significances of sex-differences in each condition are also recorded.

Overall Patterns of Social Interaction

In each of the five conditions, Ss spent most of the fifteen minutes' work session manipulating the block pieces. The greatest amount of all recorded social interaction consisted in Helping and

TABLE II

MEAN AMOUNT OF SOCIAL INTERACTION AND PERFORMANCE OF BOYS AND GIRLS GROUPS IN FIVE CONDITIONS OF COOPERATION

CONDITIONS	I Unstructured		II Task Requirements		III Task Roles		IV Group Roles		V Task Roles + Group Roles		F df 1	F df 4	F df 4
SEX	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Sex	Cond.	Sex x Cond.
BEHAVIOR													
Total Behavior	44.33	47.92	50.76	48.11	49.40	49.13	49.70	56.70	45.50	52.58	4.38	2.65 x	1.93
Social Interaction	14.20	10.21	17.40	15.15	14.90	16.25	14.67	20.83	18.19	19.21	0.20	2.95 x	1.85
Work	30.10	37.70	33.30	33.00	35.24	32.88	35.13	35.88	27.38	33.38	7.448 xx	3.95 xx	5.04 xxx
Works for Self	6.50	22.80	4.60	11.20	16.20	9.50	17.10	9.90	3.30	5.00	1.01	3.45 xx	4.26 xx
Works for Group	23.50	14.80	28.60	20.67	18.05	22.75	17.50	25.50	23.50	27.67	0.00	1.50	2.97
Helps	5.67	3.80	6.81	5.10	5.90	6.50	5.40	7.60	7.50	7.30	0.08	1.68	1.29
PERFORMANCE													
Quality	14.39	12.75	14.86	16.56	15.29	17.75	14.75	18.75	16.00	19.38	7.67 xxx	3.78 xx	1.90
Quantity	2.00	3.13	2.86	2.67	2.43	2.13	2.50	2.42	1.90	2.25	1.84	3.18 x	3.92 xx
Carefulness of Execution	2.83	2.50	2.14	2.67	2.57	3.00	2.63	3.38	2.95	3.25	11.10 xxx	6.09 xxx	3.32 x
Elaborateness of Design	2.00	1.86	1.29	1.78	1.57	2.00	1.63	2.38	1.86	2.38	12.44 xxx	2.97 x	1.54
Commonality of Theme	1.67	1.25	1.71	2.00	1.71	2.25	1.25	1.25	2.29	2.75	0.97	6.25 xxx	0.98
Overall Balance	1.33	.75	1.43	2.00	2.29	2.00	2.00	2.50	2.00	2.25	0.31	7.29 xxx	1.87
Unification	.33	.25	1.29	1.22	.86	2.00	1.00	2.25	1.57	2.00	9.31 xx	8.94 xxx	2.65 x

LEVELS OF SIGNIFICANCE:

X - - - - $p < .05$

XX - - - $p < .01$

XXX - - - $p < .001$

TABLE III

One-Way Analysis of Variance and Tests of Significance between Five Experimental Conditions

Category	Sex	Source		DF	F-ratio	Significance	Significant Comparisons	
Work	Boys	Among Groups	247.228	4	4.73	.002	III vs. V t=4.42;	p < .001
		Between Groups	52.258	100			IV vs. V t=4.86;	p < .001
							I vs. II t=3.08;	p < .05
	Girls	Among Groups	12.497	4	3.63	.008	I vs. V t=3.03;	p < .05
		Between Groups	31.024	118			Condit. I t=3.03;	p= .005
	B vs. G						Condit. V t=3.5 ;	p < .005
	B vs. G							
Works for Self	Boys	Among Groups	948.342	4	4.23	.004	II vs. IV t=2.72;	p < .10
		Between Groups	224.041	100			III vs. V t=2.81;	p < .10
	Girls	Among Groups	1056.943	4	3.746	.007	IV vs. V t=3.27;	p < .05
		Between Groups	282.179	118			I vs. V t=3.42;	p < .05
	B vs. G						Condit. I t=2.74;	p= < .01
Works for Group	Boys	Among Groups	451.01	4	1.96	.11	n.s.	
		Between Groups	230.72	100				
	Girls	Among Groups	596.965	4	2.611	.04	I vs. V t=3.18;	p= < .02
		Between Groups	228.646	118				
	B vs. G						Condit. I t=1.79;	p < .10
							Condit. II t=1.82;	p < .10
							Condit. IV t=1.66	p= .10

Continued -

TABLE III

One-Way Analysis of Variance and Tests of Significance between Five Experimental Conditions

Category	Sex	Source		DF	F-ratio	Significance	Significant Comparisons		
Quantity of Product	Boys	Among Groups	3.11	4					
		Between Groups	1.14	100	2.74	.03	II vs. V	t= 3.24	p < .05
	Girls	Among Groups	3.78	4			I vs. III	t= 3.96	p <.005
		Between Groups	.84	118	4.48	.003	I vs. V	t=3.13	p <.05
	B vs. G						Condit. I	t=3.03	p= .005
Quality of Product	Boys	Among Groups	7.72	4					
		Between Groups	35.72	100	.22	n.s.	n.s.		
	Girls	Among Groups	165.280	4					
		Between Groups	22.947	118	7.20	.001	I vs. II	t= 2.96	p < .05
	B vs. G						I vs. III	t= 3.77	p < .005
							I vs. IV	t= 4.43	p < .001
	B vs. G						I vs. V	t= 5.13	p < .001
							Condit. IV	t= 2.92	p= .006
							Condit. V	t= 1.87	p < .10

Accepting Help. As mentioned above, negative social behaviors, including negative evaluative criticisms, occurred only very rarely. We are, then, dealing here with groups who accept the common goal, who are working in an non-evaluative, accepting climate, and who display almost exclusively positive social behaviors characteristic of cooperating groups.

Comparison Among Conditions

We may start by noting the results of the basic control condition in which Ss were given freedom to proceed in any way they wished, without imposition of any kind of required work-structure from E.

The Unstructured Situation

The mean total behavior, as well as the mean social interaction, for both boys and girls, is lower here than in any of the other conditions. Examination of the working patterns in greater detail shows that girls compared both with girls in the four other conditions as well as with boys in the same condition spend a considerably greater amount of their interactions engaged in working. However, as seen in the means for Works for Self and Works for Group, their manipulation of pieces is highly solitary. Comparing now the girls' performance, again both within the condition with boys and across conditions with girls, we note that the girls high rate of work is reflected in their larger quantitative score, but poorer qualitative score. They are outscored by the boys on every performance subscore in this condition. The quality of their work is significantly poorer as compared with girls in any of the other conditions.

The girls' behavior in an unstructured situation with only a common work-goal to unite them may be characterized as follows:

they interact relatively little with each other, work diligently for and by themselves to produce work of relatively poor quality. Compared with the girls, the boys' work-pattern is more group-oriented and their performance is of superior quality. Comparison of boys in Condition I across conditions is more complex and will be taken up at a later point in this analysis.

The Task-Requiredness Condition

Demands that work be performed to meet specified criteria cause both boys and girls to abandon considerably their individual working patterns. There is a decrease in self-oriented work-patterns and a corresponding increase in working for the group, as well as in the Helping category. It may be recalled that task-requirements were specifically intended to increase interdependence. That is, Ss would have to work together to fulfill the demands growing out of the task. This is indeed what seems to have happened.

For the girls, there is a sizeable increase in the average quality of work. It is to be noted that this qualitative improvement in Condition II occurs primarily in the task-required characteristics of the product: balance, unification and commonality of theme.

For the boys, the overall quality of productivity is unaffected; they too respond somewhat to the task-requirements by improving the balance and unification of their design. In contrast with the girls, however, the boys' elaborateness of design is poorer and care in execution suffers also. One might infer that while the boys accepted the work-requirements, such a structure was actually restricting to them, in some respects, whereas it proved helpful to the girls.

The Role-Structure Conditions

Results from the three role-conditions are examined together, because they demonstrate consistent trends. Again, strong sex differences are evident.

As the role-demands for increased interdependence increase in the different conditions, so do girls systematically respond by greater absolute amounts of interaction with each other, increased group-oriented behavior, greater helpfulness, and a systematic increase in mean quality of performance. This trend culminates in Condition V, though it is noteworthy that while behavior and performance differences between Condition II and III, as well as between III and IV are in the expected direction, they do not reach statistical significance.

In Condition IV, where interdependence is created through group roles which require girls to pay attention to each other and to communicate with each other, social interaction is indeed maximal, and helpfulness is greatest. This increased sociability is presumably held in check by knowledge of task-requirements also present in this condition, so that the quality of work is not affected detrimentally. It is suggestive, though, that in this condition Commonality of theme is lowest both for boys and girls; perhaps the group-roles resulted in greater acceptance of diversity of ideas, thus reducing the commonality score. Relevant here is also that whatever minimal amount of negative social behavior was found, occurred primarily in this condition.

In Condition V, where maximal role-interdependence was created, practically no self-oriented work occurs: the girls work almost

exclusively together for the common goal. Their mean quality of performance is highest, and approaches the maximum possible score of 24.

Boys, over the three role-structure conditions, follow a more-or-less invariable pattern of behavior: they are relatively unresponsive to induction of behavioral role-demands, their performance does not change significantly either when required to assume task-roles, or to assume group roles. In fact, in Condition III and IV there is a trend toward solitary work: mean Works for Self increases from 4.6 in Condition II to 16.2 in Condition III and 17.10 in Condition IV. This finding suggests that boys interp role-demands by assuming greater individual responsibility. Only when the constellation of role-demands becomes massive -- in Condition V -- do they respond by increase in relevant social behaviors and improved quality of performance. Thus, in the last Condition, they become more similar to the girls in that Condition, and more similar to themselves as they functioned in the Unstructured Condition.

DISCUSSION AND CONCLUSIONS

Social Climate and Cooperation

We have attempted to extend analyses of cooperation which focus on goal-interdependence to include additional sources of interdependence in groups. In the determinants of interdependence among group members one must include the "climate" of the culture in which the groups are working. More particularly, one must look for group standards in regard to competition or cooperation, or, put differently, in regard to individuals working independently or together. Consideration of this type of ideology seems particularly relevant

in school settings where strong standards fostering independence are the rule. In our study, Ss were placed into a situation where social interaction was valued quite explicitly: E attempted actively to remove classroom restraints against social interactions (particularly if they involve noise, movements from assigned seats, etc.). In fact, E made a point of communicating her expectation that Ss would enjoy working together as agroup. Such a positive climate seems a pre-condition for cooperation; its impact cannot be assessed here as it was held constant in all conditions. Repetition of this study in an atmosphere less conducive to interdependent work may very well show quite different results.

Thus, two of the most important variables known to stimulate cooperative behaviors were present in all our conditons: the combination of being placed into a climate which fostered member interaction, and placement into a group which is required to work toward a common goal. The fact that task-and-role-requirements had sizeable effects in this study attests to their importance as additional determinants of cooperative behavior.

Interrelationships between task-requiredness, task-roles and group-roles

It must be kept in mind that this study has singled out only a few of several possible sources of interdependence and manipulated them in an exploratory, overview fashion; detailed in-depth analyses are indicated for next steps based on some of our findings.

A major area of questions concerns relationships between task-requirements and task-roles. We have restricted the term task-requirements to denote accomplishments which must be achieved by performance of the task according to specific criteria. In our

case, the final product had to consist of a common pattern which was balanced and unified. The conventional definition of task-roles was adopted which refers to expected member behaviors by which the task is to be executed, including for the present both how it is to be done and who is to do what. In the literature, notoriously lacking in definitional rigor in this area, these two concepts are usually not distinguished (for further discussion, see Gross et al, 1958). Yet they denote two separate operations since task-requirements are linked to product-measures, while task-roles are measured by member behavior. Recognition of their potential for independent variation should lead to much conceptual clarity and empirical research.

One of the main obstacles in attaining definitional clarity of the two concepts under discussion is the fact that, to date, no criteria exist as to the size of the descriptive unit for either of these concepts.[2] In our study, task-roles were described to Ss on a very general level, which coincided with task-requirements for purposes of experimental control; additionally specified was only the expectation of division of labor as to who must do what. That is, the roles of Balancer, Unifier and Designer were created without stating details of exactly what each person in a given role was to do. It may very well be that because task-roles were defined primarily in terms of task-requirements differences between Conditions II and III did not reach statistical significance. And it might be argued further that differences between the remaining conditions were similarly reduced by the constant presence of task-requirements (the latter were necessary for control purposes).

A second important aspect of task-roles is their function in relation to member interdependence. In this exploration, task-

requirements were designed primarily with a view toward creating member-interdependence and by their very nature created role-interdependencies. That is, in order to have a "balanced" or "common" design, each member's performance had to be related to that of the others. It would appear likely that some tasks will create stronger interdependencies among members than others. One might conceive of, and explore experimentally, a continuum of task-role interdependencies varying from an extremely low task-role interdependence such that division of labor would allow work to be carried out by each member independently, to one where each person's working step is a prerequisite for the other members' step -- obviously the highest degree of task-role interdependence.

Similar analyses must be made of group-roles. Is performance of certain important group-roles essential for work under cooperative conditions, regardless of the nature of the task? Group-roles, even as minimal as were created in our study, orient group members toward each other so that task-required activities may take place. Would it, then, be useful to conceive of "group-requiredness" in the same way as we accept the concept of task-requiredness? If so, perhaps an analogous theoretical distinction might be made between group-requiredness and group-roles. Group-requirednesses for cooperative work would then detail what group-functions are to be performed, including such functions as utilization, coordination and integration of work by different members. Group-roles would denote the behavioral expectations as to how it is to be done and who is to do what. In the study under consideration, group-roles were defined only by laying down a few minimal behavioral expectations in the area of

attending to others and communicating. Again, future studies should and could specify additional group-requirements, assign group-roles to specific members, accompanied by detailed behavioral pro-scriptions.

We suspect that it is the presence of required group-roles that often seems to reduce individual competitive motivations under cooperative work conditions -- a hypothesis with no opportunity for testing in the present study. It is also likely that it is the extent to which skills in execution of group-roles are present that largely determines quality of performance. Without presence of some group-roles, task-roles may be perceived as a personal charge and while heightening personal motivation and responsibility, may lead only to individual effort rather than to greater interdependence. This may have occurred in Condition III, where the boys showed a considerable reduction in working for the group though the same trend in Condition IV is not so readily explained. It is, however, also likely that exclusive enactment of group-roles, at the expense of task-role performance, may hinder the group's accomplishment. This did not happen in Condition IV, probably because of the presence of task-requirements so strong as to create some kind of task-role-expectation in each member. We would posit the necessity for maintaining a delicate balance between these two sets of roles, their relationship probably depending on such factors as specific task-requirements, familiarity of members, their skills in working together, and so forth. Our study has offered clear evidence that performance in cooperative conditions can be improved by the simultaneous presence of task-roles and group-roles.

We have deliberately not considered in this study individual differences in skills available for execution of required tasks,

as well as in ability to respond to role-demands. Obviously, provision of optimum conditions will come to naught, unless there are also present the skills needed for their execution. A recent publication presents a needed systematic categorization of tasks on the basis of requirements which they impose on groups (Steiner, 1972). It permits analysis of relationships between task-requirements, available resources among group members, group process and resulting productive performance. Such a conceptualization would seem to hold great promise for analysis of classroom activities and pupil roles.

Sex differences in behavior and performance

Sex-differences emerged as one of the most interesting, consistent and strongest findings. Briefly, they may be summarized as follows: girls responded to the role-demands created in the different conditions, whereas boys did so minimally. Secondly, when no task-requirements or role-demands were made (Condition I), boys' quality of work was better than that of girls. Corroboration of these differences can be found in several different lines of research. Hoffman has integrated these diverse studies in a theory which relates girls' task-performance to affiliative needs, and that of boys to their orientations toward mastery of problems (Hoffman, 1972). In our Comparison Study which employed the same type of task, boys also performed better than girls, and were more confident in their ability (Pepitone, 1972). If one cares to speculate, one might attribute the boys' superior performance to a spatial factor which is allegedly more developed in boys and may be useful in our task. Or, it might be argued that boys' play school experiences include more block play in small groups which may give

training for the kind of cooperative skills required with pattern blocks. Both of these propositions might lead to the conclusion that boys might react quite differently when faced with different tasks which require different skills than our task.

There is supportive evidence for the contention that the boys' relative unresponsiveness to E's demands might be a function of greater confidence in their work: in a recent study in this series (Torop, 1973), where E offered critical and/or helpful comments, boys tended to ignore her: when criticisms increased in strength, boys became more defensive than girls. Girls were more responsive to E's criticism, and able to utilize E's suggestions for improvement. Similarly, in our earlier study, girls were found to pay more attention to, and presumably were more influenced by, each others' work than were the boys. These findings point to girls' greater "unsureness" about their performance and are in agreement with other data which describe girls' greater anxiety and its deleterious effects on performance (Maccoby, 1972). Might their behavior be different when faced with male experimenters, or with different kinds of role-inductions? These are questions that cannot be answered in this study.

What this study does suggest is that individual properties of learning tasks and their effects on behavior should be examined intensively. Here one may recall that the least amount of social interaction and poorest quality of work for both boys and girls occurred in the Unstructured Condition. This would seem to be an important finding, contrary to current popular Neo-Rousseau-ian notions about "creativity" presemed to be "released" under such con-

ditions of "non-interference". The generality of our finding needs to be explored further; here we can only conclude that a relatively unstructured activity, with few task-required demands made on members of a working group, does not necessarily increase their social interaction or the quality of work.

For educational theory, our study suggests a re-evaluation of the place of cooperative work in school settings. On the one hand, there are value-questions pertaining to the aims and uses of interdependent work in classrooms. But aside from these, there are questions pertaining to best fit between nature of learnings and structure of the medium by which mastery is to be attained. Where is individual work most indicated, where work under cooperative conditions? And, if the latter, what is gained by leaving the work-situation unstructured, and what is lost? What task-requirements and role-specializations should be demanded? Should suggested work-patterns differ for boys and girls? And, where in the curriculum is there a place for the instruction of pupils in the necessity for, and use of, group-roles?

BIBLIOGRAPHY

Bales, R. F. Task roles and social roles in problem-solving groups. In E.E. Maccoby, T.M. Newcomb and E.L. Hartley (Eds.) Readings in Social Psychology, New York: Holt, Rinehart & Winston, 1958, 437-447.

Bronfenbrenner, U. Two worlds of childhood -- U.S. and U.S.S.R. New York: Russell Sage Foundation, 1970.

Charters, W.W., Jr., Social Psychology and Education; Am. Ed. Res. J.; 1973; 10; 1; 69-78.

Clifford, M. Competition as a Motivational Technique in the Classroom; Am. Ed. Res. J.; 1972; 9; 1; 123-137.

Deutsch, M. A theory of cooperation and competition. Human Relations, 1949; 2; 129-151.

Deutsch, M. An experimental study of the effects of cooperation and competition upon group processes. Human Relations, 1949; 2; 199-231.

Gross, N.; Mason, N.S. and McEachern, A.W.; Explorations in Role Analysis, New York: John Wiley & Sons, 1958.

Hammond, L.K. & Goldman, M. Competition and non-competition and its relationship to individual and group productivity; Sociometry; 1961; 24; 46-90.

Hannah, B.H. Cooperation and competition in the classroom: effects of degree of similarity of the task on the behavior of children in groups; Unpubl. Ph.D. dissertation; Bryn Mawr College, 1970.

Henry, J. Attitude organization in elementary school classrooms; Amer. J. of Orthopsych., 1957; 27; 117-133.

Hoffman, L.W. Early Childhood Experiences and Women's Achievement Motives, J. of Social Issues, 1972, 28; 2; 129-156.

BIBLIOGRAPHY

Jackson, P.W. Life in Classrooms; New York: Holt, Rinehart & Winston, 1968.

Maccoby, E.E. Sex differences in intellectual functioning in Bardwick, J.M. Readings on the psychology of women; New York: Harper and Row, 1972.

Madson, M.C. Developmental and crosscultural differences in the cooperative and competitive behavior of small children; J. of Cross-cultural Psychol.; 1971; 2; 4; 365-71.

Pepitone, E.A. Responsibility to the group and its effects on the performance of members; Unpublished Ph.D. Dissertation, Univ. of Michigan, 1952.

Pepitone, E.A. The effects of instructional practices on student learning, emotional growth and interpersonal relations; Proposal for research submitted to U.S. Commissioner of Education, 1969.

Pepitone, E.A. Comparison behaviors in elementary school children; Amer. Educ. Res. J.; 1972; 9; 1; 45-63.

Steiner, I. Group Process and Productivity; New York: Academic Press, 1972.

Stendler, C, Damrin, D., & Haines, A.C., 1951; Studies in cooperation and competition, I: The effect of working for group and individual rewards on the social climate of children's groups; J. of Genet. Psychol.; 79; 173-197.

Thomas, J. Effects of facilitative role interdependence on group functioning, Human Relations, 1957; 10; 347-366.

Thompson, B.G. Effect of cooperation and competition on pupil learning; 1972; Ed. Res.; 15; 1; 28-36.

Torop, N. Effects of Adult Evaluation on Elementary School Children's Work and Social Interaction; Unpubl. Ph.D. Dissertation, Bryn Mawr College, 1973.

Chapter IV *

RESPONSES OF ELEMENTARY SCHOOL CHILDREN TO AN ADULT'S CRITICAL EVALUATIONS : AN EXPERIMENTAL STUDY OF AFFECTIVE TONE AND HELPFULNESS

The Introductory chapter has described the key position of Evaluative Behaviors in our programatic theoretical formulations and emergent research. Such behaviors, we maintained, feature prominently in any interpersonal helping relationship. In the classroom in particular, ~~education~~ evaluation may be considered an integral part of the educative process as practiced in our schools today. In the widest sense of the term, evaluation can be defined as the process of determining the worth of something. So conceived, evaluation is a complex process, composed of affective and cognitive components, involving standards which may vary from objectively agreed-upon requirements to purely subjective judgments.

Teachers evaluate children in many ways, and for many reasons. One of the main reasons for pupil evaluation is said to be determination of the optimum level of difficulty at which learning may proceed for a given pupil. But at least as important is evaluation used as a motivational device which functions as a means toward administration of potential rewards and punishments. And, as we have discussed elsewhere (Pepitone, 1972), peer groups constitute another potent source of evaluation in the classroom, although their manifold effects are known only anecdotally. Evaluations in school may range from the deliberate and formal, as constituted by, for instance, report cards, to varieties of unintentional evaluations. The latter have been of concern lately in studies of teacher expectations concerning pupil performance. Evaluations may be obvious and verbalized explicitly, and range here, too, into every shade of non-verbal subtleties so that a teacher's mere look or emotional tone becomes capable of carrying loaded evaluative messages.

* This chapter consists in large part of excerpts from Dr. Torop's PhD dissertation. The writer, of course, takes full responsibility for the interpretations presented in this colation which may differ from her intent.

A. Overview of Research Concerned with Teacher Evaluation

Because of the recent interest in classroom interaction, there is a large amount of research directed at identifying effective teaching behaviors. These usually include evaluative behaviors, although there is no interaction system designed for observation of classroom behavior which is exclusively devoted to evaluations. Almost all systems have some categories such as praise, approval, acceptance onf studert ideas, supportiveness, positive tone, as well as their negative counterparts. Because of the near-infinite possibilities of combining the different ingredients of evaluations mentioned previously into different evaluative teaching patterns which, additionally, are measured differently by different investigators, comparability of different studies is difficult to achieve.

It is not within the scope of this chpater to include an exhaustive review and critique of these studies. For excellent recent summaries, the reader is referred to Brophy and Good (1970), Rosenshine (1971), Senior and Brophy (1972) and Toron (1973). A few broad generalizations seem to emerge from this large body of research with reference to effects of negative teacher evaluations on pupil achievement. In half of the studies involving teacher use of criticism, there were obtained significant negative correlations between such criticisms and pupil achievement on at least one criterion measure Rosenshine, 1971, p.59). There is no study which shows that reward is ineffective (negatively related to achievement), be it in the form of external reinforcement (candy,money), or intrinsic satisfaction with work, or be it praise, approval ,or acceptance and use of student ideas. The problem seems to lie in the area of negative evaluation,criticism,disapproval, witholding of rewards,etc. Sometimes they help, sometimes they hinder.

There are emerging also some demonstrations of sex dif-

ferences in teacher-pupil interaction which point to boys receiving more evaluative comments, primarily in form of teacher disapproval and criticism in response to boys' disruptive classroom behaviors rather than their academic performance (Brophy and Good,1970). No definitive statements can be made from the few empirical studies on effects of teacher evaluation on variables mmmm other than performance,including such crucial aspects as pupil self-evaluations, attitudes toward teachers, classroom atmosphere, or social behaviors toward peers.

Rosenshine (1971) may be said to have made most progress in theorizing about effects of negative teacher evaluations by attempting to classify studies(which themselves made no fine distinctions) into those using mild or strong intensities of criticism. The dimension of helpfulness of criticism was not thus analyzable. One can infer that giving directions, eliciting clarification and rejecting or correcting a student's response all have a definite informational component designed to be useful to the student. Other forms of criticism are less clearly informational in intent. Criticisms involving shaming, threat, warnings, and personal control are clearly stronger in affect. It would seem plausible that this distinction would have important implications for some of the differential effects of negative evaluations found in different studies. But it would seem to be very difficult, if not impossible, to make such distinctions in the study of ongoing classroom interaction. Accordingly, Torop attempted to develop a theory which separates cognitive and affective aspects of critical evaluations, to manipulate these components independently in an experimental situation, and to determine their effects not only on pupil performance, but also on their self-evaluations and evaluation of the adult who was meting out these criticisms.

B. Theory of Functions of Negative Evaluation

The following constitute the basic assumptions and theoretical

formulations on which the research was based which is presented in this chapter.

1. Critical evaluations serve an information giving function.

2. The information giving function differs along a continuum of helpfulness. That is, a critical remark such as " You are not doing this right" at the very minimum tells a person that he must change his behavior, even though it gives no further clue. The same critical evaluation can be more helpful if it is followed by a constructive suggestion as to how to do it. We hypothesize that, other things being equal, whether a criticism is accepted by a child, and how the critical person is reacted to in turn by the child, depends on the degree of perceived helpfulness of the critical remarks. To test this assumption two degrees of helpfulness were created.

3. Critical evaluations have an affective component which has more personal effects.

4. The strength of the criticism affects the perceived extensiveness of personal involvement. That is, mild criticism is seen as disapproval of the specific act being criticized, while strong criticism is perceived as a general negative appraisal of the total person. To test this assumption, two degrees of affect were created.

5. There is an interaction between the affective and cognitive dimensions of evaluation: As criticism increases in strength, the affective component so overwhelms the person (he has to react to the attack, defend himself, or otherwise protect himself) that he is not able to use whatever informational elements may be contained in the criticism.

Following these assumptions, it was expected that a child's classwork would be least detrimentally affected by mild helpful criticism, since he will be able to use the information given and not be threatened by strong attack. Strong criticism, either helpful or non-helpful, is predicted to interfere more with the child's performance and to be detrimental to his evaluation of his own product. Evidence for his need to defend himself should be found in his reactions to the Evaluator. Previous studies,

including the Role Facilitation Study described in Chapter III, led to expectations of sex differences in patterns of reactions to the various types of evaluation.

C. Experimental Procedures and Design

1. Overview.

Chapter II has described in detail the identical methodology employed in the Role Facilitation and Critical Evaluation studies, including the work task and its requirements, measurement of productivity, social interaction categories and measurement instruments. The sample of 210 fourth grade children (105 boys, 105 girls) was taken from the same suburban school district. Further, the two experimental procedures were identical in all major respects: three like-sexed fourth graders were selected at random from a given classroom, taken one group at a time to an unused classroom in the school, and asked to work together on a task which requires cooperative action for its completion. Substantial differences, of course, existed in the Independent Variables which were investigated in the two studies and which created entirely different experimental conditions.

2. The Experimental Conditions.

Five experimental conditions were created to vary affective tone and helpfulness of evaluation. The evaluations were created by E, who walked around the working group in an obviously evaluative pose in all conditions, making critical and/or helpful comments at two minute intervals in exactly prescribed fashion. The conditions were as follows:

The No-Comment Condition. (NC)

There were no comments made to the children in this condition. It serves as control; children merely received the task-instructions and then were permitted to work uninterrupted for fifteen minutes.

The Mild Condition. (M)

The critical comments in this condition were mild in affective strength. There were no helpful clues given. The six comments in the Mild Condition were:

1. It's OK.
2. That's not bad.
3. It could be better.
4. Well, it's all right.
5. That's not too bad.
6. I guess that will have to do.

These comments were fairly neutral in content but they were said in a mildly negative way.

The Mild-Helpful Condition. (MH)

The same critical comments were given in this condition as in the Mild Condition. Each criticism was combined with one of the following helpful suggestions:

1. Remember, you can make lots of different things with these blocks, like flowers, people, trains, cars, or just pretty designs.
2. Why don't you spend some time deciding what your whole design is going to be?
3. Remember you want the design to be well balanced. That means there should be something in each third.
4. Why don't you try doing something to pull the whole design together, like making a border?
5. Don't forget that you are going to want to end up with one big picture, not three separate ones.
6. You don't want to have too much empty space left on the board.
7. The more things you add to the design, the more interesting it will be.
8. Your parts should all go together in some way.

The suggestions could be said to be objectively helpful because they reminded the subjects of the task-requirements set down in the instructions. Following these suggestions would indeed aid their work.

The Strong Condition. (S)

The critical comments in this condition were designed to be stronger in affect than those in the Mild Conditions. There were no helpful clues given in this condition. The six critical comments were:

1. You didn't get off to a very good start.
2. That's not too good.
3. You're not doing very well.
4. That isn't very interesting.
5. Is this the best you can do?
6. That's still not too good.

These comments were said in a more negative way than the comments in the Mild Conditions.

The Strong-Helpful Condition. (S H)

This condition incorporated the critical comments from the Strong Condition and the same helpful suggestions as those listed under the Mild-Helpful Condition.

All evaluations were made by the same experimenter, who also gave the initial instructions. Attempts to keep the conditions as stable as possible, and precautions taken to prevent any lasting effect of critical evaluations on pupils have been detailed in Chapter II, Section D,2.

C. Results

The major body of results was obtained through the use of analysis of variance. In order to test the theoretical predictions, the conditions were combined into Helpful and Non-Helpful, as well as Mild-Critical and Strong Critical. The Torop dissertation consists of 377 tables, as for each of the major variables two-way statistics (Sex by experimental Condition), as well as Tests of Significance between means of each variable for each condition had to be computed. Here, only major summaries of results will be presented, to allow the emergence of broad generalizations about effects of critical evaluations, rather than including some of the many minor complex results of pupil interactions which would tend to obscure the total outlines. First, experimental effects on pupil productivity will be considered, followed by effects on work patterns. The remainder of the results will focus on self-evaluations and reactions to the Evaluator.

(TABLE 13)

Mean Scores For Each Productivity Category In The Combined Experimental Conditions

Category	Experimental Condition				
	No Help	Helpful	Mild	Strong	NC
Total Productivity - Boys	15.15	16.36	15.50	16.01	16.86
Girls	13.64	17.93	14.93	16.64	16.14
Elaborateness of Design - Boys	1.86	1.98	1.93	1.90	2.00
Girls	1.78	2.07	1.78	2.07	2.00
Distinctness of Theme - Boys	2.00	1.90	2.00	1.90	1.71
Girls	1.57	1.86	1.57	1.86	1.71
Commonality of Parts - Boys	2.28	2.86	2.43	2.71	2.28
Girls	1.86	2.71**	2.00	2.57	2.28
Unification of Design - Boys	0.78	0.93	0.71	1.00	1.43**
Girls	0.57	1.86**	0.93	1.50	1.00
Balance Within the Design - Boys	1.21	1.40	1.26	1.36	1.43
Girls	1.36	1.50	1.36	1.50	1.43
Balance on Board - Boys	1.71	1.86	1.71	1.86	1.43
Girls	1.00	2.00**	1.28	1.71	1.71
Quality of Execution - Boys	2.71	2.78	2.86	2.64	2.86
Girls	2.71	2.86	2.78	2.78	2.86
Quantity of Execution - Boys	2.86	2.64	2.57	2.93	3.71**
Girls	2.78	3.07	3.21**	2.64	3.14
Agreement on Theme - Boys	1.28	2.00**	2.14**	1.14	0.86
Girls	1.71	1.86	2.14	1.43	2.00
Conception of Theme - Boys	0.71	1.21	1.43**	0.50	0.86
Girls	1.71	1.57	2.00	1.28	1.43

**Significant Result

Table VII

Table VII presents a summary of the mean scores for each productivity category in the Combined Experimental Conditions.

I. Summary of the Effects of Negative Evaluation on Productivity

It was hypothesized that children in the Helpful Conditions would have higher productivity scores than children in the Non-Helpful Conditions. For the total group score as well as several of the subindices--namely: Commonality, Unification, and Balance on the Board--girls did better in the Helpful Conditions than in the Non-Helpful Conditions. The only category in which the boys did better in the Helpful Conditions was Agreement on Theme. It would therefore appear that girls were more influenced by the evaluator's helpful suggestions.

In looking at the conditions individually, it was found that the girls did better in the Strong-Helpful Condition than in the Mild-Helpful Condition. This finding was not predicted. A possible interpretation is that the theoretical formulation was basically correct, but that the operational definitions of strength of criticism did not permit an adequate test. That is, the mild criticisms were so neutral that they were not always seen as critical. If the children thought they were doing well, then there would have been no imperative to change their work. The stronger criticisms may actually have carried more clear information that they were not doing well, and consequently there was more need to change their work to please the evaluator. The

issue of sex differences will be discussed in a later section.

It was also predicted that children in the Mild Critical Conditions would have higher productivity scores due to heightened defensiveness under strong criticism. This hypothesis was borne out for the girls in terms of Quantity of Execution. They used significantly less pieces in the Strong Critical Conditions than in the Mild Critical Conditions. For boys, strong criticism significantly lowered their Agreement and Conception of Theme. All criticism, mild or strong, helpful or nonhelpful, resulted in lowered quantity scores for boys when compared to the No Comment Condition.

In order to understand the effects of evaluation on productivity better, the actual behavior of the children while they were working on the task must be examined. Following the discussion of the interaction data, the responses which the children made to the evaluator will be presented. The results of the post-task questionnaires in which the children had an opportunity to express some of their own feelings about the task, each other, and the evaluator will also be examined. From these sources of data an attempt will be made to derive a better understanding of the effects of negative evaluation.

2. Effects of Negative Evaluations on Work Pattern.

It may be recalled that the Role Facilitation study found the patterns of Working for Self, as opposed to Working for the Group, most responsive to the experimental manipulations of role interdependence. Table VIII presents Means Scores for Working Behaviors in the Combined Experimental Conditions. It may be seen that important trends in the working patterns appear here as well.

Table VIII

Mean Scores for Working Patterns in the Combined Experimental Conditions

Category	Experimental Conditions NC	NH	H	M	S
Places Pieces Self, Boys	17.40**	15.93**	5.68	8.55	13.26
Girls	7.45	12.99	12.80	7.67	18.12**
Places Pieces, Group					
Boys	14.52	13.57	21.23**	18.38	16.32
Girls	26.69**	16.19	16.36	21.10**	10.45
Common Work Pattern					
Boys	0.28	1.21**	1.28**	1.21**	1.28**
Girls	0.71	0.43	0.86	0.93**	0.36

** Significant Result

When threatened by Strong Critical Comments, girls work more for themselves and less for the group. This trend is also reflected in the smaller amount of time three girls worked together on a common pattern in the Strong Critical Conditions. Thus, it might be hypothesized that girls withdraw more into themselves and rely on themselves in a crisis. Boys, however, worked together more under all conditions of negative evaluation than they did in the No Comment Condition. It may be recalled that boys used significantly more blocks in the No Comment Condition than in any of the critical conditions. It seems as though boys, when threatened, pull together more and work together more, although the criticism seems to inhibit their work output.

3. Effects of Negative Evaluations on Self-Evaluations and Evaluations of Partners.

It was of particular interest to determine immediate after-effects of the evaluator's criticisms on the childrens' self-evaluations, as well as of their evaluations of their partners' contributions, as such data are not available from any of the classroom interaction studies which deal with negative criticism. On post-task interviews, Ss were asked to rate their own performance, as well as that of each partner, on a scale that ranged from "excellent" to "really blew it", with the lower score reflecting higher evaluations.

Self-evaluation results are presented in Table IX. Of particular interest here is the strength of the affective component of criticism. It may be seen that both boys and girls evaluated themselves lower in the Strong Critical Conditions than in the Mild Critical Conditions. There is no question but that children are affected by the Evaluator's strong negative criticism to the extent of de-valueing their own performance.

The results of asking the children to rate each other's performance were very similar to the results of the self-evaluations, although the boys tended to evaluate each other more harshly in the Strong Critical and Strong Helpful Conditions than did the girls.

Table IX

Tests of Significance Between Means of No Comment, Mild Critical, and Strong Critical Experimental Conditions for Rated Evaluation of Self

Sex	Comparison	Diff	SE	DF	t-test	Significance
Male	NC vs M	0.19	o.23	61	0.838	N.S.
	NC vs S	-0.50	0.25	61	-1.990	N.S.
	M vs S	-0.69	0.21	82	-3.322	.005
Female	NC vs M	0.07	0.18	61	0.389	N.S.
	NC vs S	-. 31	0.17	61	-1.824	N.S.
	M vs S	-0.38	0.16	82	-2.446	.050

TABLE ~~231~~ X̄

Two-Way Statistics (Sex By Experimental Condition) For Rated Evaluation Of First Partner

		Experimental Condition				
Sex	Statistic	NH	M	MH	S	SH
Male	Mean	2.14	2.67	2.33	3.05	3.38
	S.D.	0.85	0.80	0.73	1.02	1.24
Female	Mean	2.68	2.28	2.43	2.86	2.57
	S.D.	0.59	0.78	0.60	0.96	0.75

TABLE (232) X̄I

Analysis Of Variance Between Experimental Conditions For Rated Evaluation Of First Partner

Source	DF	SS	MS	F-Ratio	Significance
Sex	1	2.30	2.30	3.159	N.S.
Cond	4	18.60	4.65	6.374	.001
Sex By Cond	4	7.17	17.93	2.458	.047
Unit	200	145.90	0.73	Not Tested	

Tables 233 and 234 show that boys evaluated their first partner lower in the Strong Critical Condition than in the No Comment Condition. They also evaluated their first partner lo r in the Strong-Helpful than in the No Comment or Mild-Helpful Conditions. There were no significant differences for girls.

4. Responses to the Evaluator.

We have seen that E's critical evaluations had clearly an effects on the pupils' evaluations of their own performance, as well as that of their partners. Equally important was determination of pupil responses to the Evaluator who was, after all, the source of the negative input. Both the E and an additional process-observer recorded S's verbal comments which followed immediately after a critical and/or helpful comment was made. These responses were then coded into pre-determined categories.

Out of the great many responses made, not all were affected by the experimental conditions. Only those of theoretical interest will be briefly described here. Group Disintegration occurred very rarely; only three out of the seventy experimental groups literally "fell apart"; they happen to have been boys' groups, who had not been working together well from the outset and became increasingly tense as they continued to receive negative criticisms. As they were distributed across conditions, no further generalizations are warranted at this point.

Occasionally there occurred "conspiratorial whispering", as it was coded; it may be assumed that "uncomplimentary" statements were being made about E, but since their occurrence was rare, and the verbal content unknown, they were not analyzed further. More dramatic responses were found upon occasion when a group "cleared the board",i.e. took off pieces in response to strong criticism. None of these responses, however, proved statistically significant, although they tended to be made primarily in the Strong Conditions. And, as expected, children ignored more of E's comments in the Mild Critical Conditions than in the Strong Conditions which almost demanded some kind of response.

The remaining responses to E can be divided into three major groupings: the children either were Confused by the critical comments; Accepted E's influence (accepts Suggestions,Changes Work), or Resisted E's influence (Rejects Suggestions,Hostility,Defensiveness). Table XII presents means of these responses to the Evaluator in these three categories across Experimental Conditions.

TABLE (369) XII

Summary Of Means Of Responses To The Evaluator

Response	Condition							
	M	MH	S	SH	No Help	Helpful	Mild	Strong
Confused By Evaluator								
Boys	1.36	1.24	1.83	1.17	1.60	1.20	1.30	1.50
Girls	0.93	1.10	2.52**	1.48	1.73	1.28	1.01	2.00**
Accepts Evaluator's Influence								
Boys	0.71	3.45**	1.62	3.05**	1.17	3.25**	2.08	2.33
Girls	1.00	3.62**	2.36	2.93**	1.68	3.27**	2.31	2.64
Resists Evaluator's Influence								
Boys	0.93	0.88	2.02**	2.10**	1.48	1.49	0.90	2.06**
Girls	1.24	0.36	1.60**	1.00	1.42**	0.68	0.80	1.30

**Significant Result

TABLE XII -73

The table clearly shows that girls were more confused by strong criticisms than by mild criticisms. They were, however, not as resistant to strong criticisms as boys were. The interpretation seems justified that girls, being more dependent on approval from adults than boys, might clearly be confused by disapproval, but would then attempt to do something in order to gain approval, such as changing their work. Boys, on the other hand, with confidence in their own ability to do this task, would understandably become angry when criticized and resist the evaluator's attempts to influence them.

The acceptance of the evaluator's influence in the Helpful Conditions by both boys and girls reflects the relevance of the helpful suggestions, as well as the power of an adult to influence children through criticism of their work. The fact that girls, more often than boys, incorporated the suggestions into their product, is again interpretably in terms of their need for approval and dependency on adults which has been found in several studies, including our own investigations , as reported in Chapter II I.

The affective component of criticism was reacted to more by boys than by girls. Strong criticism resulted in increased defensiveness among boys, and was associated with correspondingly worse performance. Thus, the theoretical formulations regarding the interactive effect of the affective and cognitive dimensions of criticism were supported in that they did consistently better in the Mild-Helpful Condition than in the Strong-Helpful Condition, as shown by several of the subscores of the productivity index. Girls, on the other hand, were not more defensive in the Strong-Helpful Condition than in the Mild Helpful Condition. Thus, the fact that their productivity scores did not vary, is added support for the assertion that where personal defensiveness is aroused, informational elements are not used as effectively.

One possible interpretation of the lack of defensiveness among girls under conditions of strong criticism is that although the comments were labeled strongly critical, they were, in fact, still relatively mild, and hence were less disturbing to the girls who were primarily oriented toward utilizing E's helpful suggestions. Assuming that boys were governed more by independence motives, such critical intrusions would be felt as more disturbing.

Of course we cannot be certain specifically what the reactions would have been under strong, more personal critical remarks. This must be left to future research, as is suggested in Chapter VI.

The present study has demonstrated pronounced effects of two degrees of relatively mild critical evaluations on pupil performance, work patterns and responses to the adult Evaluator. Again we have found strong sex differences in pupil reactions, in line with those described in Chapter III. It is all the more important to note that one of the few responses made both by boys and girls to critical evaluations was a lowering in self-evaluations. Implications for the classroom are taken up again in Chapter VI.

Bibliography

Brophy, J.E., & Good, T.L. Teachers' communications of differential expectations for childrens' classroom performance: Some behavioral data. J. of Ed. Psychol., 1970, 61, 365 -374

Rosenshine, B. Teaching Behaviours and student achievement. England: National Foundation for Educational Research in England and Wales, 1971

Senior, K. & Brophy, J. Praise and group competition as motivating incentives for children. Paper presented at the annual meeting of the AERA, Chicago, April, 1972

Torop, N. The Effects of adult evaluation on elementary school childrens' work and social interaction: An Experimental study of affective tone and helpfulness. Unpublished Ph.D. Dissertation, Bryn Mawr College, 1973

Chapter V

EXPLORATIONS OF SOCIOECONOMIC CONTEXTS, INDIVIDUAL DIFFERENCES AND SOCIAL INTERACTIONS IN COOPERATIVE WORK

In describing our methodology, Chapter II has alluded to the difficulty of obtaining background data on individual pupils. This is somewhat of a paradox since there seems to be an intense interest in individual pupil differences by educators in general, and teachers in particular. One might wish to speculate about origins of this orientation - evoking, for instance, the context of American individualism and one of its offsprings, the testing movement and its impact on schools. Be this as it may, in discussions of our research with educators they inevitably express their concern with individual differences and social background variables in pupils' motivations to compete, skills to cooperate, and so forth. And in teacher audiences, the majority of questions is directed toward exceptions to the trends we had described, often including vivid examples of individual differences.

The contrast, then, is all the more striking, when as a researcher in pursuit of such data, one encounters increasing reluctance of public and private school officials to grant access to relevant data. The reasons for this state of affairs are many, and many of them justified: there is the increasing awareness of parental and community groups of individual rights to privacy and anonymity. Add to this public scepticism about intelligence testing, apprehension about excessive "researching" in schools and the use of pupils as guiney pigs, and it becomes obvious why there is difficulty in a public school system when one wants to deal with individual differences.

For our research it has meant that we have not been able to obtain descriptive background data on each child, or even from each school. This ruled out any kind of attempts of pupil matchings based on such personal variables. Two kinds of approaches eventually became feasible: Dr. Torop, in her role as School Counselor, was justified in dealing with a variety of school-achievement and

personal background factors of the 210 pupils used as subjects in the Critical Evaluation study. As part of her dissertation concerns, these were cross-analyzed against the childrens' social behavior and performance in the experimental sessions. Secondly, as mentioned previously, because of ongoing research supervised by the writer in two schools with widely differing socioeconomic settings, it was possible to obtain data on social interactions of fourth grade pupils from these two contrasting schools.

The two sets of data complement each other: both deal with the same behavioral measures, for both sexes, within the same age-range, working with the same materials in a highly comparable cooperative work setting. Furthermore, many of the separate individual variables cross-analyzed by Dr. Torop may be considered precisely the kind of variables which, combined, make up the socioeconomic context which differentiates the two schools in the second study.

The two analyses are examined next; they are intended primarily as explorations of interrelationships within this complex area.

A. Interrelationships among Descriptive Personal Variables and Social Interaction

The following personal data were available for each pupil: Age; Social Class (Hollinshed's Index); Mother's Employment; Father's Education; Mother's Education; Number of Children in the Family; Pupil's numerical Position in Family; Reading Achievement; Arithmetic Achievement; (both Iowa test scores); IQ; Teacher ratings of pupil's learning interest; Teacher ratings of pupil's ability to get along with others; Test Scores of Social Power (MIARQ Scale); Self-Evaluation; (Coopersmith Inventory); Sociometric Rank.

Nothing is easier than conjuring up an unending list of "hypotheses" about these variables and their relationship to prosocial behavior. Instead, we decided on an empirical exploration, crossanalyzing each of these variables against the grouped social interactions obtained for the same pupils in the Critical Evaluation Study. This correlational matrix is presented in Table XIII.

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TABLE XIII

Correlations Between Individual Variables And Behavior Categories

	Works Only	Total Inter-action	Pos Eval	Neg Eval	Neut Eval	Total Eval	Self Eval
Age	-.13	-.12	0	-.06	-.08	-.05	-.05
Social Class	.07	.01	.06	.02	-.10	.03	0
Mother Works	-.04	-.02	-.01	-.05	-.12	-.04	-.03
Father's Ed	.09	-.03	.02	.03	-.06	.02	0
Mother's Ed	.02	-.03	-.06	.06	-.04	-.01	.09
Child in Fam	.04	-.13	-.05	-.07	-.08	-.08	-.02
Younger Ch	.01	-.11	0	-.06	-.07	-.04	-.02
Older Child	.04	-.07	-.04	-.04	-.06	-.06	-.02
Child's Pos	.05	-.07	-.05	-.04	-.06	-.06	-.02
Read Ach	.04	.08	.15	.08	.13	.16	.09
Math Ach	.09	0	.01	-.10	.06	-.05	-.05
IQ	-.01	0	.10	-.01	.08	.07	.07
Learning Int	.07	-.07	-.15	-.11	.11	-.14	.10
Gets Along	.32*	-.15	.06	-.25*	.05	-.19	-.22
MIARQ Score	.10	-.18	-.10	-.10	-.06	-.12	-.05
SEI Score	-.06	.06	-.02	-.08	-.04	-.07	-.01
SEI Lie	.11	-.10	-.02	.01	.01	0	0
Soc Rank	-.18	.04	.07	.02	-.01	.05	.07

TABLE XIII -- Continued

Other Eval	Group Eval	Req Help	Help-ing	Accepts Help	Ignores	Rejects Help	Pos Social Beh	Neg Social Beh	Avoids Task
-.05	.02	-.14	-.16	-.05	.09	-.01	-.13	-.01	.08
.04	.02	-.10	.04	-.05	-.09	-.06	.02	.02	-.09
-.08	.08	.04	0	.04	-.14	-.04	.02	-.06	.05
.04	-.01	-.12	-.02	-.06	-.08	-.06	-.03	.01	0
-.08	-.02	-.06	-.07	-.08	.11	0	-.10	.10	.12
-.12	-.01	-.02	-.12	.04	-.01	-.02	-.07	-.14	.11
-.03	-.05	-.12	-.13	-.04	.16	.01	-.10	-.01	.06
-.10	.03	.05	-.04	.07	-.12	-.02	-.01	-.14	.08
-.10	.03	.05	-.05	.06	-.12	-.03	-.01	-.14	.08
.08	.19	.06	.20	-.15	-.05	-.01	.10	-.02	.01
-.06	.03	-.11	.18	-.12	-.04	0	.07	-.07	-.07
.03	.04	.08	.16	-.24•	-.08	.14	.02	-.09	-.09
-.12	-.04	-.12	.03	.04	.03	-.10	-.01	.01	.01
-.14	0	-.22	-.03	.05	-.03	.14	-.01	-.19	-.11
-.10	-.11	-.04	-.16	-.14	-.04	-.12	-.20	-.08	.04
-.07	-.07	-.10	.16	.09	.05	-.07	.14	-.01	-.15
-.05	.07	-.08	-.01	-.08	-.02	-.10	-.05	-.09	.04
.06	-.05	.14	0	-.05	.08	-.01	-.01	0	.12

•Significant Result

Only three correlations appear significant - and within this large a matrix one must assume that they could have occurred by chance (The three correlations are indeed intrigueing: The significantly negative correlation between IQ and Accepting Help suggests Independence variables in association with intelligence; the teacher's ratings suggest that the child who "gets along with others" is the child who in a work situation which demands cooperation works quietly without much verbal interaction and most definitely does not engage in negative evaluations....thus a rationale for almost any correlation could be established which one might have found). Several explanations suggest themselves for this remarkable lack of correlations:

a. the high correlation of level of interaction with each type of social behavior (see Table II, Chapter II). This might preculde association of any one individual variable with some one type of social behavior. Still, one might expect certain variables, say for example, teacher ratings of a child's interest in learning, to be associated with the majority of social behaviors, on the assumption that the highly active child is the most interested child (assuming also that teacher ratings are reliable indices).

b. strong experimental effects produced by critical evaluations in the different conditions may have masked relationships which actually do exist.

c. strong sex differences in behavior which were found may similarly obscure existing relationships.

d. while any one variable may show no relationship with behavior, specific patterns of variables may.

e. homogeneity of sample. While teachers may perceive wide individual differences in ability, personality, behavior and so forth, Ss come from an overwhelmingly affluent suburban environment which reduces individual variability considerably. Our correlations, following this argument, explored only a narrow range of a continuum, and hence no relationships can be expected.

Each of these arguments has implications for further analyses of the data. A number of these have been explored. In some cases (e.g. carrying out subanalyses within a given experimental condition, separating Ss further by sex and other confounding variables) we were left with too few cases to be able to demonstrate significant trends. Dr. Torop pursued her special interest in Locus of Control, and found indeed that "internal" boys (that is, boys who take more responsibility for their own academic success or failure) were more hostile in response to the Experimenter's critical evaluations. But these same boys' social behavior in the experimental session, as well as their performance, was no different from "externally" determined boys (boys who allocate blame to others rather than themselves).

These kinds of explorations led to our conclusion that such empirical, atomistic approaches are not likely to yield meaningful answers to our questions.

B. Socioeconomic Background and Behavior in Cooperative Work Groups

In order to clarify the basis of choice of our comparison sample, a few evaluative comments on contemporary studies of pupils and their socio-economic background is perhaps indicated.

Sociologists measure socio-economic standing by indices that focus on various combinations of familial variables such as income, occupation, education, housing, etc., to obtain somehow an easily-determined "global" measure of familial "life-styles". This area constitutes a vast sociological wasteland of imprecision and simplistic thought about what differentiates one class-segment from another. No wonder the little research on childrens' social behavior from different segments of society is contradictory. For instance, Doland & Adelberg (1967) found a greater amount of sharing among middle class nursery children, as compared with "lower class children" in a welfare center. And how is his sample comparable to Ugural-Semin's (1951) whose "middle class children" were more "selfish" than "poor children"? Obviously, comparisons are indicated between homogeneous samples which differ in some known, important, socio-economic ways.

But here, social realities take over when attention is focused on poor, inner city children. Who would take issue with the assumption that familial economic status somehow has causal effects which leave their mark on the offspring. But, in order to determine the exact mechanics of the process, a number of intervening variables are plugged in. Economic deprivation becomes equated with "cultural deprivation". And so, today's literature on the "Culturally Deprived Child" focuses on intervening variables such as cognitive styles, linguistic patterns, impulse control, etc. Social behaviors in general, and pro-social behaviors in particular, are rarely discussed. Head start and other federal and local programs have missed tremendous opportunities to learn more about these childrens' social behaviors.

And, interestingly, it is precisely these behaviors which have been fastened upon by a few writers in the social sciences intent on calling attention to the "strengths" of poor and minority group families. Their theorizing tends to start with the large size of the nuclear family and/or the extended family and its beneficial socializing effects on growing children: especially frequent are descriptions of older children taking over parental care-taking functions of their younger siblings, with beneficial effects to both the "carer" who is developing social responsibilities and the small child who is receiving nurturant support which an absent, wage-earning mother cannot provide. In fact, it is this argument of role division, expanded and documented in Bossard's unique and pioneering study of The Large Family System (Bossard, 1956). What these writers have to say, is all in some sense relevant to our concerns. But the state of imprecision, and non-comparability of populations and data should be evident, and hence the confusing state of theories and conclusions one encounters when investigating socio-economic variables. What we see as needed is an approach that starts with known populations which can be characterized exactly, in respect to several important attributes, so that juxtaposition of these populations makes theoretical sense, and to then study in great detail pupil behavior of these two populations, placed into identical

situations.

It was precisely this approach we explored in the study to be reported. We did not want to study pupils in the inner city of Philadelphia, for this would have, among many other variables, confounded racial and ethnic differences. We wanted to avoid confounding variables or "disorganized" families. We were looking for a homogeneous, white sample of children of intact families with working parents, not economically deprived, yet not as affluent as the Main Line Sample we wanted as a comparison. For we were beginning to see affluence and deprivation as figuring prominently indeed in the social behavior of children, as will be indicated at the end of this chapter.

The school with which arrangements could be made, School LM, is located in the midst of what sociologists would refer to as a "lower middle class working district", in North East Philadelphia. The 1970 census information lists the Median Income as $9,357; Mean values of homes as $8,700, and the percentage of those owning homes as 12.8%. Those renting, pay a mean rent of $82. Seven per cent of the fathers are listed as "professional"; seventy percent of the fathers' occupations are distributed in the following few categories: Clerical, 25%; Foreman, 17%; Operators, 17%; Service Workers, 12%.

The school itself is one of the few almost wholly white schools in the city. The building looms large, several stories high. The school yard is paved, staffed by paraprofessionals occupied with soothing hurts and settling arguments amidst much tumult and milling about. The school halls are empty while classes are in session; clear teacher voices are heard from open doors, pupils with attentive faces are aligned in conventional rows in fairly large, clean, quiet classrooms. At dismissal-time, a small group of mothers gather outside, some pregnant, some with baby carriages and/or toddlers. "Safety-guards" appear on each corner.

School UL, on the suburban "Main Line", has been recently built in a setting of rolling green country. It features the currently-popular ranch-style one-level plan, glassed-in windows in each classroom, separate access to an outdoor, grassy

center court. Classrooms interconnect, so that pupils, student-teachers, teachers and visitors can and do pass freely and almost unnoticed from one room to the next. Informal clusters of children are gathered in classrooms and out of doors. At dismissal-time, the parking lot fills up with huge stationwagons driven by smiling young mothers, often with small children strapped beside them in the front seat. Over 80% of the Fathers are listed as "professional" and "managerial", with income level or value of home not stated.

In these two schools, then, the two developmental studies of cooperation and competition are proceeding. In each school there is one Experimenter and two Observers; both teams have developed observation categories and research procedures together; periodically, they switch schools with each other to determine their comparability and reliability. And it is the fourth graders' social behaviors from these two schools that is of interest to us here. In each school, two sections were studied. The same procedures were used as in our previous studies: three children at a time were brought into the experimental room. The only difference was that they were simply told one task-requirement, namely, to make one big person together. The Experimenter then retired to a more distant part of the room and did not interact with the children until they were finished. If the task was not completed by fifteen minutes, they were interrupted. Comparison data, including working process and behavior, as well as performance indices, are presented in Table XIV .

First to be noted is the identical mean age, as well as the non-significant difference in mean percentile achievement ranks in both Mathematic and Reading Scores. This certainly runs counter to common sense expectations, but is quite in agreement with, for instance Coleman's 1966 survey as to overall nation-wide non-significance of school facilities and other physical imputs as a variable in scholastic achievement, especially so on the elementary level. (Coleman, 1966). From the point of view of comparison of the data on social behaviors of these two

TABLE XIV

Group Process and Performance under Cooperative Work Conditions by Fourth Grade Pupils from Lower Middle and Lower Upper School Environments

	Schools		
	LM (N= 66)	LU (N= 60)	
Sample Characteristics	Means	Means	Significance
Age, in months	119	119	
Achievement, Math	58	64	.81
Achievement, Reading	57	60	.63
Group Process			
Working Separately	.60	.10	4.20***
Working Together, Unspecialized	1.08	1.30	.62
Working Together, Specialized	2.30	2.10	.91
Number of Directors	.58	.83	3.20***
Social Behavior			
Positive Evaluation	.87	.33	2.70**
Negative Evaluation	2.40	.69	2.40**
Neutral Evaluation	5.89	6.86	1.02
Gives Help	12.77	4.72	7.01***
Rejects Help	3.10	1.40	2.74**
Asks Help	2.20	1.30	1.76*
Looks at Experimenter	3.30	1.80	1.85*
Looks at Peer	2.44	2.28	.22
Group Product Indices			
Motion; Figure Complexity;		Chi Square shows no differences	
Completed Figure		"	
Completed Figure-in-Role		"	
Stick Figure		"	
Face and Partial Body			
Proportion			
Number of Objects	1.25	1.30	.41
Size of Product	12.50	20.50	7.01***
Differentiation Score	12.50	14.50	2.6*
Number of Pieces Used	66.70	108.80	4.3***

Levels of significance: * = .10, ** = .01, *** = .001

groups, which we are about to inspect, interpretation of differences is simplified as they cannot be attributed to differences in age or achievement levels.

When group process is examined, the following is noted: There is no difference in the amount of time children spend working together, sometime they all work on the same part (the meaning of "unspecialized"), sometime dividing their work ("specialized"). But, in addition important differences emerge in their work-pattern -- LM children work significantly more often separately, that is, on a part that is not part of the group common product. The mean of .60 lies between the coded points of "None of the time" and "some of the time". By contrast, UL pupils hardly ever work separately; instead, there emerges in almost every group one person who "directs" the work of the group. This occurs also in LM groups, but significantly less often.

To interpret the groups' process, additional examination of their social interactions is necessary. And here LM pupils display significantly more frequent social behaviors: there is much evaluating going on, both positive and negative, help is being asked for, much help is being given (almost three times as much as by UL pupils), some help is being rejected.

To complete the picture, the end-products of Ss from the two schools must be compared. On indices which we assume to be more likely indices of intellectual development -- figure complexity; degree of figural proportion; stick-figures vs. full-figures; number of objects in design, motion -- Chi Squares show no differences. Again we receive no support of differences in intellectual prowess among the two groups of pupils in agreement with the achievement scores reported previously. Where significant differences in performance of the two populations do occur, was unexpected and is highly suggestive: UL children make significantly larger persons; they use almost twice as many pieces on the average as compared with LM children,

and their figures show more detail.*

How can we interpret these differences and similarities among the two populations? It depends on how far one is willing to go beyond the data. What follows is frankly and deliberately speculative, intended as offering hypotheses to be pursued in further studies. We feel this is the main value of such studies; our own larger comparisons are continuing and will, hopefully, themselves provide additional tests of our notions.

The integrating concept, as we see it, has to do with the affluent child's self-image, with confidence in his own power, with concern for himself, sensing few restraints in his way in pursuit of his own goals. His constructions are large, he uses blocks freely. These children are not greatly concerned with each other or with the experimenter. They work with each other, yes, but there is no evidence that they do so because they need each other. They work together because they have been given the task to do so. One gets the impression they are used to working together in this fashion; one assertive child assumes leadership, goes mostly unchallenged, and so each functions in his own way, pursuing freely and securely his own goal, rather than being concerned with each other.

The latter mode is precisely the predominant working style of the LM pupils -- more restrained, more tentative, less certain of themselves -- note the significant attending to E, the frequent asking for help of each other. They perceive themselves more as a working group; they are less concerned with themselves, than with the goodness of their group's product -- hence they feel free to evaluate, and free to help each other.

* This score might be considered a rough index of intellectual functioning, but in the light of absence of differences in indices more directly concerned with intellectual development, we are inclinded to interpret this score as merely a function of the number of pieces used. And it should be noted here that, as found in our other studies, there is no relationship between the quantity of pieces used and quality of performance, as measured by complexity and other descriptions of the completeness of figures.

No other differences emerge between these two groups because, after all, this is a non-threatening, non-demanding situation. But let it turn into a situation where satisfaction of own needs potentially conflicts with satisfaction of needs of other group members -- where, for instance, each child is asked to make his own figure -- we would predict considerably more competitive behavior in the UL pupils. As of this writing, data are being analyzed which examine this prediction.

Some supportive evidence is available from our first series of studies which analyzed competitive behaviors of children from the same affluent suburban population (Pepitone, 1971, pp. 33-34). Here, a significant trend was found, relating father's level of education (read: roughly, level of SE standing) to son's Besting Behaviors, as follows: while boys whose fathers' had not finished high school showed least Besting, those with education beyond college had sons with the highest amount of Besting. Boys whose fathers' education stopped with completion of college, fell in between (respective means: 1.17; 2.11; 2.94; difference significant at the .05 level).

Also pertinent was the systematic trend in Besting as function of family size: The largest amount of this behavior was found in the smallest families (either one child, or one sibling), while least besting was found in the large family (four or more children). Here it should be recalled that no such relationships were found between the same two variables and pro-social behaviors in the Torop study; this adds to our contention that Besting behaviors, and behaviors in competitive situations in general, are more unitary and clear-cut, then are behaviors in cooperative situations which, by definition, require greater interdependence.

While these studies are small exploratory investigations, they help to begin to integrate our views of conditions under which cooperative and competitive behaviors will occur. We have not studied children who can be said to be trully

"economically" deprived, and the present study is our first contact with a population composed primarily of lower middle class school children, and here, the concept of an affluent background seems to be most pertinent.

It is not difficult to make theoretical causal connections between Familial Affluence* and Self-concern in children (common language makes the connection with the term of "spoiled brat"). The value of such a formulation, as we see it, stems from the linking of socioeconomic background to a variety of social behaviors that can be expected. It is then not merely a question of whether the affluent child will be more-or-less selfish, more ready to give than poorer children, to engage in prosocial behaviors. Rather, it helps to specify under what conditions such a child will engage in specific social behaviors.

Thus, from a child's concern with satisfaction of own goals, one can derive that, in general, he will be less concerned with attending to those peers that hold no relation to him as potential need-satisfiers, or as potential threats. When asked to give to others, where his own needs and goals are not involved, he can afford to be "prosocial" and "generous"; where others are seen as blocking fulfillment of his own needs, they are likely to be attacked. Where others are seen as means to his need-fulfillment -- as so many cooperative work-situations are made to be in school -- he will do so. However, cooperative work, especially of a complex nature, requires, as we have shown in Chapter III, possession of <u>skills</u> to work with others, in addition to motives. And here one might expect such great self-concern to prevent acquisition of pro-social skills. And it is here that perhaps the child from a less affluent environment, as discussed at the beginning of this chapter, may be at an advantage.

*Such formulations would have to specify conditions of affluence under which self-concerns occur -- a task obviously not within the realm of this report. We are, essentially, pointing to conditions where an unlimited supply of goods is available to a child.

Bibliography

Bossard, J. The Large Family System; U. of Pennsylvania Press, Philadelphia, 1956.

Coleman, J. et al Equality of Educational Opportunity, Washington, Government Printing Office, 1966.

Doland, D. and Adelberg, K. The Learning of sharing behavior. Child Devel., 1967; 38; 695-700.

Hill, R. The Strengths of Black Families; 1972.

Riessman, F. The Culturally Deprived Child; 1962.

Ugural-Semin, R. Moral behavior and moral judgment of children; J. Abn. & Soc. Psychol., 1952; 47; 463-474.

Chapter VI

RECOMMENDATIONS

A. Implications for Research.

No grandiose recommendations are presented here. From its inception our program was intended "... not only to contribute significantly to our understanding of the effects of social relationships in classroom learning, but also... to serve as a useful research training device for Graduate Students in the Department of Education and Child Development of Bryn Mawr College" (Pepitone, 1971, Preface). Our two successive grants have contributed to this function by allowing perfection of a methodology for studying social behavior and performance in groups of elementary school children. Thus, we are now in a position to offer our students specific tools with which important problems in the area of social behavior of elementary school children can be investigated. It may be helpful to those who would like to work in this area to indicate next steps growing out of the present studies, as we see them.

1. Task and Role Requiredness.

Our study of Role Facilitation has plunged us right into the center of many theoretical issues, summarized in the Discussion section of Chapter III. There would seem to be immediate needs toward conceptualization of connectednesses that may exist between task-structures and task-requirements. This would necessitate systematic experimental explorations over a whole range of these interrelationships. Simultaneous explorations then must be concerned with task-requirements and corresponding optimum task-role relationships. The ultimate practical aim of such undertakings would be ability to specify in work-settings such as classrooms, the exact task-role structure (which conceivably could vary anywhere from solitary work to group work with exactly defined task role member interdependencies) required to perform optimally certain learning tasks.

Questions of basic group roles, performance of which may be required in any group endeavor, would seem to be a highly important issue to pursue, for, ultimately, this leads to concerns with the kind of social skills to teach children to survive, or to do more than that, to thrive as fully human social beings in the approaching twenty first century.

2. Difficulty of task.

Our studies have utilized a task which was liked by children of all ages, and was easy to perform. This was deliberately intended to be so, to control for liking of the task as well as for level of difficulty. Needed next steps should manipulate both of these variables systematically and independently. Level of difficulty, for instance, can be varied by increasing the complexity of the task requirements. Would such increase alter cooperative work patterns? And do tasks with different degrees of difficulty require performance of different task roles and/or group roles?

3. Interpersonal Attraction.

Our studies have always utilized children from same classrooms, assigned at random to their groups. Again this was deliberate, in an effort to control for the interpersonal attraction variable. Needed now are next steps of systematic variation of friendship patterns. Do friends compete more with each other than do strangers? Does performance of cooperative work benefit or suffer when it is executed by a group of close friends, or by neutral acquaintances? These are some of the immediate questions generated by our studies, which would have theoretical import as well as practical implications for the school room.

4. Critical Evaluation.

The study of Critical Evaluation dictates very specific research steps; of high priority here is a study replicating the Strong Criticism condition with a male experimenter, in order to determine the generality of the strong sex differences found in the pupils' reactions to criticism. Secondly, effects of critical evaluations must be explored over a wider range, as our variations

involved only the mild end of an envisaged continuum of criticism. Here there appear great restraints toward subjecting pupils to strong criticism in the laboratory; this suggests the feasibility of returning at this point to the classroom for observation in situ of effects of teachers known for their "negative evaluation habits". It may very well turn out that a mildly critical stranger is reacted to more strongly than a teacher known as a "habitual crab". In such a series of studies, effects of peer-evaluations must be included. To find, for example, that critical evaluations from a cooperating peer have more constructive effects than if the source is a teacher, would seem to have profound implications for peer-teaching and cross-age-teaching.

There are also intriguing issues about evaluations in relation to the public-private dimension. There are at least two major issues here: 1. Effects on self-evaluations of critical evaluations administered in private or public settings, and 2. resulting performance within either of these settings. On the level of theory, such research links up with our studies of comparison behavior -- one would, for instance, expect after a critical evaluation in public heightened levels of attentional behaviors, which, in turn, should elicit achievement-related motives and thus improve performance -- but possibly, at the expense of lowered self-evaluations. If such were found, such knowledge should be valueable for a teacher.

5. Group Standards.

We have been most conscious of the fact that our studies are open to lay-criticism to the effect that they are "artificial" in the sense of studying pupils outside of the on-going classroom. From the outset of these studies, classroom group standards have featured prominently in our theoretical formulations in their role of furnishing the context in which classroom competition and cooperation takes place. It was precisely the attempt to control this all-important variable that led us to removing pupils from their classrooms. We had the impression that class-room standards carried over into our experimental situation in the sense that, as

reported, we noticed strong restraints against openly looking at each others work, conversing while working, helping each other, etc. We had to resort to explicit differentiating of the laboratory situation from the classroom, and had to create standards which went counter to the usual classroom standards by encouraging pro-social behaviors during the session. Here, then, is again a need for replication of our studies, this time with systematic variation of standards with regard to pro-social behaviors. Some of these studies may profitably be done in on-going classrooms, although problems of control of other factors are formidable.

6. Socio-economic variables.

The Comparative study in Chapter V was exploratory and speculative in nature; almost every significant finding had to be interpreted tentatively, and from the perspective of pointing to formulations of crucial questions, some of which we hope to have raised. The currently-proceeding developmental studies of competition and cooperation in these two different socio-economic school climates will be of great importance in formulating next steps.

In this connection, it should be mentioned that our task is singularly suited for manipulating experimentally the situational availability of resources. This would have great potential for the study of children from families who differ in relative degrees of affluence and deprivation.

7. Summary.

In summary, we wish to state our conviction that the five years we have spent in formulating and executing research in the area of competition and cooperation among school children have been highly profitable and stimulating intellectually. Effects range beyond the immediate next steps outlined in the preceding pages. Some of our students are exploring our task as a diagnostic tool to be used with emotionally disturbed children. Most suggestive is its contemplated use in the study of cooperation and competition among siblings, and/or parent-child triads or other familial patterns. Almost fourty years ago concurrent surveys by May and Doob (1937) and by Margaret Mead (1937) have raised

trenchant questions about cooperative and competitive relations in different cultures. Very little of their work has been pursued. We now have opened up possibilities of replication of our studies in several European countries which are indeed of vital interest for future research.

B. Implications for Teaching.

The subtitle of our research -- The Teaching and Learning of Helping -- implies an immediate connection between our theoretical formulations, research and application to the classroom. This implication is intentional, for we see almost everyone of the issues touched on in this Report as being pertinent to the teacher. But we have also shown, in the preceding pages, the great number of studies to be carried out before definitive answers can be obtained. Meanwhile, trite but true, teaching must continue. It is our conviction that more helpful than suggestions to "use this-or-that-approach" in cookbook-recipe fashion because "research has proven thus-and-so", are aims concerned with heightening teachers' awareness of some of the problems we have discussed with the hope that this would aid teachers in making decisions which will affect classroom functioning. From this reference frame, we shall now examine some of the major areas we have discussed in the previous research section, with regard to possible implications for teaching.

1. Task Role Requiredness.

Throughout our studies runs the argument that elementary school children must be taught explicitly social skills which involve both ability to work independently as well as in interdependent role-relationships. Our society gives ample opportunities for independence-training. But independence-training can be fostered by schools through intelligent use of homework! The school is an ideal setting for development of interdependence skills for which our society gives fewer opportunities today than in the days where a child was an active member of a closely knit interdependent family unit. This is what Kilpatrick (1921) had in mind when he advocated use of the "Project Method" in classrooms. Its shortlived

popularity, we believe, is largely due to the fact that teachers were never led to think through how children can profit from each other in cooperative work. Is it any wonder that so many attempted group projects end in confusion of pupils and consternation of teachers.

Our study (Chapter III) points out that provision of a common work task does not ensure cooperative behavior, and certainly does not necessarily elicit superior performance. Most important for a teacher to note is that unstructured tasks do not lead to superior work. Contrary to some current (not really current, as they go back to Rousseauian philosophies) philosophies of teaching, our research recommends that elementary school pupils be taught explicitly some of the group-role skills needed in cooperative work. This may be particularly useful in the early elementary grades at a period where, to use Piaget's (1932) terms, the pupils are in the developmental stage of "decentering".

Throughout our work we have made a point of stating that we do not mean to imply that schools should turn exclusively to cooperative work. What we are saying is that the potentialities of cooperative work are not sufficiently exploited in our society, schools, research in general and research in education in particular. In our research recommendations we speak of the high priority which should be accorded to determination which tasks require individual work for optimal learning, and which profitably can be done within a cooperative work-structure. The implication for the teacher is, first of all to recognize that in all likelihood each task may be performed in several different ways. We have also discussed how little is known about just this issue, and the great need for research in this area. Another implication, then, is for teachers to recognize the wide range of freedom in experimenting with work-procedures in her classroom. What we are suggesting, in fact, is that the teacher herself explore task-requirednesses in relation to different task roles. We are suggesting that a teacher re-examine each task, each part of a daily lesson, questioning benefits which may accrue

to each child from the working process itself. What is gained when one pupil computes a long division by himself, as opposed to working in interdependent diads where each child is responsible for one part of the division? On the surface, an absurd question: of course a pupil has to learn to complete a long division by himself. But such tasks are assigned as part of his homework, anyway. Perhaps the classroom can be utilized differently: our research, for instance, suggests that increasing interdependence heightens individual responsibility. Applied to "shared" long division, each pupil might be motivated to work more accurately because he is responsible to his partner as well. Hence, he may be more careful, and learn that carefulness pays off in terms of fewer errors. But, is the obvious retort, he can learn this, working carefully by himself. True; but working with a partner may give him additional incentive to be careful. And further, he may be rewarded by his partner for having successfully completed his part of the problem. The shared activity itself may be more satisfying, more "fun" - with long-range benefits in formation of positive attitudes toward mathematics. The glow of shared goals successfully completed - known to pupils generally only from competitive team sports, possibly for a few from performance on the school stage - may be experienced in every shared learning situation. Joint success may increase an anxious child's confidence in his ability; he may venture out and attempt solutions which he would not approach by himself. It may increase his good feelings toward his partner. He may even learn something about responsibility to others -- especially if his teacher takes an active role in creating this understanding. Many pairs of such contented partners may significantly affect the tone of a classroom climate.

Obviously, we are not suggesting that one such experience can accomplish all these miracles -- but we are saying that they may happen in classrooms where such experiences are integrated into the pupils' daily learnings. All this is predicated on a teacher's experimenting with patterns of cooperative procedures that would bring about optimum learnings.

When we talk of "optimum learning" we realize of course that different pupils may profit differentially from cooperative work. Here we see another area of unlimited opportunities for teacher experimentation within her classroom. Not only the interpersonal attraction variable should be considered in pupil grouping (see point 3. of our Research recommendations), but abilities, confidence and other pupil-personality variables as well. Some of the same kinds of beneficial effects might be found from creating systematically cooperating classroom groups, as are reported from experiments in Cross-age teaching, with benefits to both helper and helped. (Lippitt, R. and Lippitt, P., 1968).

Each one of our recommendations has surely been tried somewhere at sometime by some teachers; the applied side of our research is aimed toward development of a systematic theory of utilizing the potential for cooperation in the classroom, so that it can be incorporated more widely, and more systematically, into teaching practice.

Some of the freer ways of organizing classrooms of the seventies -- The Open Classroom, Integrated Day programs, etc. -- would seem to offer ideal opportunities for teacher experimenting in ways we have outlined. For instance, learning centers can be set up that include systematically some activities which must be, and can only be done, individually by one pupil working alone, while other activities would be provided which require several pupils to work together in prescribed sub-activities involved in solutions of the same problem, completion of the same art work, etc.

If this were done in the elementary schools, perhaps students would not flounder so helplessly when they find themselves in Alternative High Schools. While many students have chosen these High Schools in reaction to anonymity and high achievement pressures of large High Schools, and while a high premium is placed by them and the usually youthful teaching staff of such experimental schools on relating to others in small groups, and on individual participation in decision-

making processes relating to school matters, in fact these young adults more often than not find it impossible to make group decisions (See Harvard Educational Review, 1972). "Sensitivity training" such as is offered in some such schools may help the longoverdue "de-centering" to take place, (which, according to Piaget, should have taken place in the pre-operational stage of development through experience of social interactions in which the young child's own point of view is challenged). It may even be an antidote to the intense concern with own needs and goals which we sensed to exist in the affluent suburban elementary child (See Chapter V). However, it is no substitute for the kind of skill-training in group role requiredness we see essential, especially for a generation so highly attuned to peer groups.

2. The above issues are intimately tied to issues of classroom standards. In our researches, begun in 1968, just before the Open School movements reached America, we were struck by the intense atmosphere of restraint against pupil interaction we encountered during school hours. To some extent this is true even now, as we walk the corridors of many an elementary school, and notice the supposedly-silent "lunch lines", and hear the piercing "no talking, please" issueing forth from a classroom. The Open Classroom seems to have brought with it a change in classroom standards with respect to pupil-to-pupil social interactions in the classroom. Yes, it is "freer". But so often it may be characterized as absence of restraint, rather than substitution of positive group standards for participation. We are back to the era where progressive schools were being accused of being too "permissive"; today, however, it is not a mere matter of philosophy of teaching style. Chapter III gives our research evidence to this point, and, if teacher-recommendations are to be made, let them re-read the classic Autocratic-Democratic-Laissez Fair-studies of eleven year old boy scout groups working together under these three different leadership styles (Lewin, Lippitt & White, 1939). Let them recall that in the Laissez Fair condition, the product was by no means superior, and pupils did not take as much pride in their accomplishments as when the Leader offered procedural help and suggestions.

Here, we wish to quote also from the closing sentences of our 1971 Report:" .... to reduce the chance-effects on learning and emotional development which come from uncontrolled social comparison behavior, we suggest further that pupils must be shown how to profit from the results of interaction with their neighbors. Ways must be devised of teaching children how best to learn from each other, instead of teaching them ways that lead to learning aimed at besting each other" (Pepitone, 1971, pg. 39). Our Role-Facilitation study is intended to point the direction toward how this could be done, by creating and exploiting pupil interdependence. In our formulation, the teacher functions prominently in developing and enforcing group standards with respect to such interdependence.

3. Teacher Evaluations.

It is difficult to see how the preceding suggestions to teachers could have seriously harmful effects on pupils. When it comes to generalizing to teaching situations from the Critical Evaluation study, there are potential dangers. The study dealt only with very mild evaluations, by a young woman, a stranger to the children, with evaluations being of fifteen minutes' duration at that. It would be foolhardy to presume to make inferences applicable to teachers who interact with the pupil hour after hour, day by day, throughout the year. High priority research has therefore been spelled out in the preceding section with more specificity. The study lent support for the general theory which predicts that when criticisms are non-threatening and perceived as helpful, they will be positively related to achievement. When criticism is viewed as non-constructive, it will be reacted to in a variety of ways, none of which improve performance, in fact, with increasing intensity of criticism, performance may actually be hindered. But -- applied to an ongoing classroom -- under what conditions is criticism perceived as really "threatening"? When does a pupil evaluate a teacher as "helpful"? In other words, in order for our theory to be applicable, the teacher would have to be able to fill in the actual magnitude of each parameter. A step in this direction can be taken

by a teacher, as we suggested, by her own experimenting in this area, primarily by being on the alert for potential effects of her evaluations.

One of the most important findings in the Critical Evaluation study has to do with sex differences in response to evaluation. It may be recalled that, while boys were more sensitive to the intensity of criticism, they rejected the adult's helpful suggestions, while girls appeared to be most easily influenced by criticism combined with suggestions for changing their behavior. What is the implication for the teacher? To allow boys to work more independently, and to refrain from criticism, while providing more specific guidance for girls to satisfy their greater dependency needs? Answers would seem to depend on basic conceptions about the goals of education. Should a teacher deliberately attempt to modify boys' independence needs, and, similarly, try to make girls more "independent"? In our view, this is a wrong formulation of the question. The alternative to dependence and its consequent abject acceptance of social influence is not independence, as defined as rejection of all social influence, but rather an interdependence of persons, confident in their own individuality, open to give and accept to and from each other. It is in this direction that we would like our schools to further the growth of our children.

Bibliography

Kilpatrick, Wm. H., The Project Method; The use of the purposeful act in the Educative Process; Teachers' College, Columbia, New York, 1921.

Lewin, K., Lippitt, R and White, R.K., Patterns of Aggressive behavior in experimentally created "Social Climates"; J. of Soc. Psychol., 1939; 10; pp. 271-299.

Lippitt, R. & Lippitt, P., Cross-Age Helpers; National Education Association Journal; 1968; 57; pp. 24-26.

May, M. & Doob, L., Cooperation and Competition; Social Science Research Council, 1937.

Mead, M., Edit., Cooperation and Competition Among Primitive People; New York; McGraw Hill, 1937.

Piaget, J., The Moral Judgment of the Child; London, Kegan, Paul, 1932.

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APPENDIX A 1

PRODUCTIVITY INDEX A$_1$

Score from photograph of product only.

1. Overall Impression

Before breaking down individual dimensions, rater is to inspect the photograph, and record immediate first impression:

Awful.....0
Poor.....2
Below Average.....4
Average.....5
Above Average.....6
Pleasing, Well Executed.....8
Outstanding, Creative, Unusual.....10

2. Elaborateness of Design

Board looks practically empty except for a few small random patterns.....0

Sparse pattern, confusing and/or incomplete looking.....1

Overall design clearly present, but rather simple, common.
Three separate designs, simple, common, or 1 or 2 more complex parts with 1 or 2 simple or poor...2

Intricate cotal design, holds interest, embellished parts.
Three intricate separate designs..... 4

3. Distinctness of Theme

Theme undistinguishable in any parts of whole design of pattern..... 0

Theme apparently there, even if not clear what it is (e.g. some flowers are there, other objects, total pattern unclear) or
Design..... 2

Theme clearly distinguishable for total pattern...4

APPENDIX A 1

4. Commonality of Pattern

Three (or fewer, or more) indistinct, unconnected unrelated parts.....0

Tripartite structure may still be visible, but attempt at connection of internal parts present, even though total pattern still appears unrelated.2

Commonality present, either in form of one unified pattern where parts are undistinguishable, or parts may be present, but wholly integrated into one pattern.....4

5. Unification of Design

Circular means of unifying pattern absent (neither border nor central figure).....0

Some attempt at border or central pattern, but incomplete, partial.....2

Border or central figure present, fairly well executed.....3

Border or central figure, well executed, complex, pleasing.....4

6. Balance of Design

Points are given as indicated for any of the following features: (total of 6 points possible)

a. Balance Within Design Itself

Within given pattern or object, pieces are evenly distributed, object not lopsided.....1

Relations among several parts are harmonious, even distribution (e.g., house, people, dog, all may be on one side of pattern but well proportioned).....1

b. Balance of Design in Relation to Board

Partial balance--a little off center but not totally unbalanced.....2

Pattern is centered and evenly placed.....4

APPENDIX A 1

PRODUCTIVITY INDEX B

Score from written records only (post-task interview).

1. Agreement on Theme

Source: Question #5, What was the whole design?

All three Ss have identical descriptions....4

All three Ss have descriptions referring to same kind of product, with slight variations between individuals.....2

One or more Ss do not know, or differed on theme.....0

2. Conception of Theme

Source: Question #5 (Score only if agreement)

Simple theme (a design, flowers).....1

Some elaboration of theme, but not complex, (people and houses; garden and flowers).....2

Unusual and/or complex and/or elaborate description (a space city; tracks with drawbridge and boats; people holding hands)..4

APPENDIX A L

7. Quality of Execution

With respect to placement of pieces.

Careless, haphazard placement, no attention to detail, no elaboration, colors arbitrary-appearing..0

As above for some parts of the pattern, others executed with more care.....2

Pieces placed carefully, on the whole, colors balanced, misses elaboration as detailed below.....3

As above, plus "subtle touches" which hold interest, attention to fine detail, picturesque color.....4

8. Quantity of Execution

Number of pieces counted in total pattern.

0-49.....0
50-99.....1
100-149.....2
150-199.....3
200-250.....4

Intercorrelations Of Productivity Index

	Elaborateness	Distinct Theme	Common Parts	Unification	Balance Design	Balance Board	Quality	Quantity	Group Score	Agreement	Concept Theme
Overall Imp	.76*	.63*	.38*	.38*	.69*	.66*	.70*	.19	.81*	.17	.26*
Elaborateness		.47*	.22	.13	.56*	.45*	.64*	.26*	.65*	.06	.17
Distinct Theme			.50*	.24*	.40*	.44*	.58*	.14	.70*	.27*	.29*
Common Parts				.49*	.15	.29*	.18	.01	.68*	.33*	.18
Unification					.20	.33*	.12	.19	.62*	-.04	-.08
Bal in Design						.57*	.65*	.15	.61*	-.08	-.03
Bal on Board							.40*	.15	.71*	.11	.01
Quality								.11	.57*	.20	.27*
Quantity									.31*	.22	.14
Group Score										.16	.14
Agreement											.77*

*Significant Result

Appendix A-3
Scoring System for Make-a-Person-Task
PRODUCTIVITY INDEX

Score from photograph of product only.

DOES THE CHILD

1. Follow directions: 1=no, 2=yes

a) did the child in the competitive situation make his own product. (does not necessarily have to be a person).
b) did the child in the cooperative situation work together with the other members of the group to make one product.

2. Make a person: 1=no, 2=yes

a) did the child in the competitive condition make a scorable product that resembles a person or part-person within his pie shaped area.
b) did the group in the cooperative condition make a scorable product that resembles a person or part-person somewhere on the entire board.

3. Head-face 1=no, 2=yes

a) did the child in either condition have as his scorable product only the head of a person-- with neither body, arms or legs.
b) there is no differentiation between a rather primitive head and a very elaborate one (person with eyebrows, pupils, long hair etc.) Both are scored the same way.

4. Face and partial body 1=no, 2=yes

a) did the child have as his scorable product a head and an incomplete figure.
b) examples are a head with arms and legs attached to head and n o body or a head with a partial body such as no arms and/ or legs or incomplete body torso.

5. Stick-figure 1=no, 2=yes

a) did the child in either condition make a stick figure as their scorable product.
b) a stick figure is the most frequent and simple complete body figure made with the blocks. Criteria are that arms and legs are only one block width. Body image is very simple and usually consists of only a few blocks.

6. Complete figure 1=no, 2=yes

a) did the child in either condition make a scorable product that consists of a head, body and continuous extremities. Feet and clearly defined arms and hands are not necessary for a complete figure score. This is a score of overall body gestalt.

7. Figure in role

a) did the child make a person that is dressed in an obvious costume that portrays a role.
b) examples are cowboys, indians, clowns, hockey, baseball and football players.

8. Degree of Differentiation
(If more than one person on board, only best is used for scoring purposes)

a) this is an additive score of 26 of the thirty most common items that appear in a human figure drawing (Koppitz, 1968, pg.9). Because of the limitations of the blocks in making a human figure certain items of the scale were omitted as not relevant. Over fifty photographs from the pilot study were inspected regarding this decision. Omitted items include nostrils, profile and more differentiation on clothing.

b) there is a score of 1 point for each item listed for appearance in the scorable product of a human figure.

Head
Eyes
Pupils
Eyebrows or eyelashes
Nose
Mouth
Lips-clearly defined
Ear
Hair or Hat
Body
Arms
Arms-2 dimensional(more than 1 block
Arms attached at shoulder
Arms pointing down
Elbow
Hands
Fingers
Correct number of fingers
Legs
Legs-2 dimensional(more than 1 block)
Knee
Feet
Feet-2 dimensional(side view or heel)
Good proportion (3 on proportion scale)
Clothing-- 1 piece
Clothing-- 2 or more items (bow, belt, pants, pocket book, hat etc.)

9. Number of Pieces

a) in the competitive condition, this is a total of the number of pieces used by the child within his pie-shaped area on the board. Includes not only the scorable product but all other blocks placed by child.
b) in the cooperative condition, each child is given the total of their complete production #including not only the scorable product but all blocks placed on entire board.
c) this score is counted twice by each observer at the time of testing.

10. Number of Objects
a) This is the total of the number of objects placed on the board by the child in the competitive condition withinghis space(including persons).
b) in the cooperative situation, this is the total number of objects placed on the board by the group (including persons).
c) to classify as an object to be scored the item must contain a minimum of four blocks. Examples are flowers, sun, line of grass or water. Must be easily distinguishable. Each object is scored 1.

11. Pieces in abstract pattern 1=no, 2=yes

a) this item is scored if one-third of the scorable figure is finished in a pattern of blocks placed in a meaningful way.
b) examples would be making a striped shirt or skirt or patterned pants.

12. Sex Identity 1=no, 2=yes

a) This item is a high level scoring item where sex identity must be measured by more than 1 criterion. A minimum of three should be present.
b) Examples would be long hair, skirt and pocketbook for a female. Hat, shirt and clearly defined trousers would be scored also.

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13. Size

a) This is basically a measure of height of the scorable person. Number of blocks are measured on the vertical of the figure and the total is the score.

14. Proportion

a) This is a finer measure of the body proportion of the scorable figures. There must be a total figure to receive a score. This score is not size dependent.

Incomplete figure.....0

Poor and archaic, parts of figure are not related and placement of blocks is rather haphazard..... ...1

Below average. Parts are related but poor size relationship such as overly large head for body are very long legs.....2

Average. Normal distribution and relationship between the size of the human figure-- head, body and legs. Most stick figures score in this category.....3

Above Average. Higher level of proportion of human figure, than undifferentiated stick figure. This could be seen in the addition of a belt, waist or shoulders.....4

Excellent, outstanding. This score is reserved for human figures that have immediately noticeable high level body proportion that has more than one of the previous mentioned features, such as shoulders, waist, crotch of trousers.....5
(If there is doubt on scoring this, always score 4)

15. Motion 1=no, 2=yes

a) This item is scored if the scorable figure has movement.
b) This could be either in the arms and/ or legs. It must be clearly distinguishable and not just a haphazard placement of blocks.

16. Similarity 1=no, 2=yes

a) This item is scored only when there are individual products in the condition.
b) Similarity of figures is determined on the basis of three, easily discernible similar characteristics of one figure to another in the group. Both are score . These characteristics include color, shape and placement of blocks used.

APPENDIX B 1 - pg. 8.

Definitions of Interaction Categories

Changes Pattern: Changes from one pattern or design to a new pattern.

Works Alone: Works independently in own section.

Two Work Together: Two children place pieces cooperatively in one section.

Three Work Together: All three children work on same pattern.

Evaluation Behaviors: This category included all evaluative statements, task oriented and personal, directed at self, other, or the group. Evaluations were coded as positive, negative or neutral.

Helping Behaviors: These categories included all behaviors related to helpful acts.

Expresses Need for Help: Expression of need or difficulty.

Asks Help: Direct requests for help.

Helps (nonverbal): Responds to requests or initiates help by manipulating blocks.

Helps (verbal): Responds verbally to a request for information or help, offers information, gives procedural directions, corrects another child's work.

Accepts Help (positive, negative, ignores):

Accepts nonverbal help, rejects nonverbal help, or ignores nonverbal help.

Accepts Suggestion (positive, negative, ignores):

Accepts verbal help, rejects verbal help, or ignores verbal help.

Hindering Behaviors: Negative behaviors which interfere with reaching the goal. These include negative responses to requests for help or obstructing another's efforts.

Aggressive Behaviors: Physical or verbal aggression,

expressed anger at others, hostile remarks and teasing. Aggression often is associated with hindering behavior.

Individual Behaviors: Non-facilitative toward group goal.

Individual Assertion: Insistence on doing own design without regard for group goal.

Besting: Clear instances of competitive behavior. Statements, gestures or actions which show motivation to better or best another child.

Stands Around: Not doing anything constructive for significant periods of time either because of immobility or task completion.

Leaves Field: Joking, talking about irrelevancies, attempts to avoid task due to rising tension.

Responses to Evaluations

Following each critical comment the responses of each of the children were coded. The categories and their descriptions are listed below:

Ignores: No visible response to evaluation.

Confusion: Asks questions or exhibits hesitation or indecision.

Accepts Suggestion: Positive verbal response to evaluation.

Rejects Suggestion: Verbal rejection of suggestion made by evaluator.

Hostility: Hostile remarks to evaluator.

Changes Work: Tries new pattern in response to evaluation.

Whispering : Conspiratorial whispering

Clears Board: Removes all pieces from section.

Group Disintegration: Group clearly falls apart; general confusion.

Defensiveness: Attempts to justify product, place blame.

NOTES FOR OBSERVERS

WORKING BEHAVIORS

When children are working on design without doing anything else, record every 15 seconds.

Placing Pieces: When each child is working in his own section, record under Works Alone, Places Pieces. If he is working for himself, cod: 1-1, 2-2, 3-3. If he is working for the group, after a group decision, code: 1-g, 2-g, 3-g.

If two are working together, record under 2 Work Together, Places Pieces. Code: 1-g, 2-g, or 1,2-g.

If all three are working on one part of the design, record under 3 Work Together, Places Pieces. Code: 1-g, 2-g, 3-g, or 1, 2, 3-g.

Work Pattern: How the children work determines which section to record other behavior in.

Works Alone: Record behaviors in Works Alone section when child is placing blocks on own section of board without help from anyone else.

2 Work Together: When 2 children are working together on one section or in the center of the board, record all behaviors in the 2 Work Together section.

3 Work Together: When all 3 children are working on same portion of design, record all behaviors in 3 Work Together section.

Changes Pattern: Each time a child changes what he has made into a new pattern, record here. Do not record each time he changes one piece. This category is reserved for occasions when child removes several pieces and begins again on new pattern.

EVALUATION BEHAVIORS (+ 0 -)

This category includes all evaluative statements, task oriented and personal, directed at self, other, or group.

Self Evaluation: "Mine is really good." 1-1+
"Mine is terrible." 1-1-
"I'm really smart." 1-1+
"I'm really stupid." 1-1-

Self Eval. (cont.):
"I know how to do this." 1-1+
"I can't do this." 1-1-

Other Evaluation:
"Yours is great." 1-2+
"Yours is awful." 1-2-
"You really know what you're doing." 1-2+
"You're good at this sort of thing." 1-3+
"You can't do it." 1-2-
"That's not the right way to do it, Alice." 1-2-
"Alice is good in art." 1-2+

Group Evaluation:
"This design is really neat." 1-g+
"We're doing a terrible job." 1-g-
"We're good at this." 1-g+

HELPING BEHAVIORS

Expresses need for help:
Expressions of difficulty of task.
"This is hard."
"I don't have enough blues."

Asks help:
Child asks another how to make something. Child simply makes general request for help. Child asks for blocks of certain color. All direct requests for help or information, eg.:
"Help me, Julie." 1-2
"How do you make a flower?" 1-g
"Give me the blue blocks." 1-g or 1-2 if directed at specific person.

Helps (nv):
1. Child responds to request for help by manipulating or giving blocks to another. Tag all these response behaviors with an "R"--1-3R, 2-3R.

2. Child initiates helping behavior without being asked, manipulates other child's pieces, gives blocks to another child, picks up block from floor for another. Code: 1-2, 3-2.

Helps (v):
1. Child responds to request for help or information with a verbal reply giving the requested information.
"You need white ones to make a star." 2-3R
"Use the yellow ones for the head." 2-3R

2. Offers information, gives procedural directions, corrects another child.
"Let's make a border." 1-g
"Julie, put the blue ones here, like this." 1-2
"Nellie, if you put red ones there it will look more like a flower." 1-3

Accepts help (+ 0 -):

Child may be pleased to have help and accept it positively. 1-2+
May reject help offered either verbally or by pushing away the hand of the helper, or by changing back what the helper has tried to do. 1-2-
Ignores help (does not take a block which is offered but does not actively reject). 1-2 0

Accepts sugg. (+ 0 -):

Pleased with suggestion and follows it. 1-2 +
Rejects suggestion by saying he doesn't want to do it that way. (If rejection is followed by an individual assertion, record there, too.) 1-2-
Ignores suggestion. 1-2 0

HINDERING BEHAVIORS

Hinders:

1. Negative response to request for help by blocking child from seeing how to make something or by keeping blocks from him. 1-3R

2. Obstructs another child's efforts to make a design. Takes pieces off another's section.

3. Negative verbal response to request for help.
"Don't bother me." 1-3R
"Do it yourself." 1-2R
"Don't copy." 1-2R

4. Ignores request for help. 1-2R

5. Conspiring with one child against third.
"Let's not let Julie have any blues." 1-3
If second child goes along, score hindering for him (her) also. 2-3

6. Any negative verbal behavior which obstructs another child from reaching the goal, or obstructs the group from reaching the goal.
"Don't look at mine, do your own." 1-2
"Everybody has to do their own thing, no looking." 1-g

Aggression to other: Whenever a child expresses aggression toward another, record here. This category will probably require judgements about tone of voice. For example-- "Don't just stand there, make something." is an aggressive remark. Any physical aggression, hitting, hair pulling. Cursing at each other, hostile remarks, making fun of another child.

INDIVIDUAL BEHAVIORS

Individual Assertion: When one child insists on doing his own thing without regard for the group goal. "I don't want to make a border; I'm going to make my own design." (also rejects sugg.)

Besting: This is a fairly pure category to cover clear instances of competitive behavior. Statements, gestures or actions which show motivation to better or best another child are included.
"Mine's the best one."
"I'm finished first."

AVOIDANCE OF THE TASK

Stands Around: Not doing anything at all for at least 15 seconds, and every 15 seconds thereafter that child does nothing.

Leaves Field: When tension builds, children may begin joking, talking about irrelevancies, or in some way try to get away from the task to relieve anxiety.

APPENDIX C-1

pg. 14

Explanations of Research Project
Presented to Superintendent, Principals and
Other Relevant Personel

Title of Study: Cooperation in the Elementary Classroom:
The Teaching and Learning of Helping

Name of Applicant: Dr. E. A. Pepitone
Department of Education and Child Development
Bryn Mawr College

Date: May 1972

A. Statement of the Problem

1. Purpose. Our research is funded by the Department of Health, Education and Welfare and constitutes an inquiry into conditions that are conducive to the development of cooperative behavior in elementary school children.

2. Justification.

a. Significance of Problem. Today's society has perhaps a greater need than ever to develop in its children genuine feelings of caring for each other and to develop abilities to translate these feelings into action. In addition to independence training and individual achievement orientation, children need to be given inter-dependence training. The school environment consists of classroom groups and is an appropriate medium for such teaching and learning to take place.

b. Relevance of research to school system. Today's innovation classroom structures - "The Open Classroom", "The Alternative High School", etc. - lay heavy stress on individual freedom of choice and responsibility in group settings; "work-projects" - "team activities" - "group discussions" - abound. It is our contention that such innovations are doomed to failure unless pupils are also given the skills required to function in these complex group situations. Our basic assumption, thus, maintains that pupils must be motivated and taught how to cooperate.

B. Hypothesis. We assume that the following conditions must be created in the classroom to lead to interpupil cooperation:

1. Projects must have built into them interdependent work-structures so that a common group goal can be created.

2. Each pupil must be assigned a specific function within a given work-structure.

3. Positive standards about cooperation must be created and pupils must be shown how to relate to, and work with, each other.

C. Procedure.

1. Sampling. Approximately 150 fourth grade pupils are needed.

2. Collection of Data. Three fourth-graders at a time are taken out of class for c. 45 minutes and taken to a separate room (library, music room and the like). They are presented with a group activity which involves making a design out of pattern blocks onto a large circular board. Appropriate procedural instructions are designed to create the three different conditions hypothesized to bring about interpupil cooperation (See B on pg. 1). Their interpersonal behaviors are recorded by trained interaction observers. The group product will be scored according to a predetermined scheme.

3. Analysis of Data. Statistical multivariate analysis of pupil behavior will be employed.

4. Time required. All instruments have been pretested.* The total research should require one month of intensive investigation.**

D. Personnel and Facilities.

1. Personnel. The study will be conducted by two Bryn Mawr College Graduate Students: Carol Silberberg and Jane Crawford.

2. Time schedule. The experimental procedure requires one hour each of each child's time; three children at a time will be used.

3. Facilities. All materials are provided by the Applicant. The study requires only the use of an empty room in the school. (We have been able to use library- home economics room- back-of-stage, etc.- in previous studies). Fourth grade teachers will be given in advance lists of children who will be called out of the classroom at specified times which are agreeable to the teacher.

* The material is identical with that used by Ms. N. Torop in '71-72, and Ms. B. Hannah in 1970, with elementary school children from Lower Merion School District.

** Since there is barely one month of school left, it is of the greatest important to finalize arrangements as fast as possible.

APPENDIX C-2

General Instructions for Role-Facilitation Study
and for Critical Evaluation Study

Hi - I'm Mrs. _____, and this is Miss _____. We've both come from BMC - which isn't far from here. We've brought something for you to do which will help us learn about fourth graders. Miss _____ may do some writing while you are working, but don't let that bother you. In fact, once you get started, pretend that both she and I are invisible.

First I'm going to give each of you a number and you tell me your name. Do you ever work together in groups on a project in your classroom? What kinds of things do you work on in groups? ... Do you like working in groups?... That's good, because today you are going to work in a group on this project which I've brought. As you can see we have a big board here. And here is a tub of blocks of different colors and shapes. The blocks have a small piece of white material on the back which sticks to the board, like this. (Demonstrate). So you can put the blocks down and they won't move. If you want to move one you just pull it off, like this. (Demonstrate).

I would like the three of you to work together to make one big design on the whole board out of these blocks. Lots of other boys and girls your age have tried this, and they've really enjoyed it and done it well. As you can see, the board is divided into three parts, one for each of you. You will each be responsible for your part of the design and for the whole design as well.

There are lots of things you can make out to these blocks. For example, you can make flowers, people, trains, cars, or just plain designs. Or you can make anything else that you want to.

APPENDIX C-3

Instructions for Task Requirements

There are just a few things that you should keep in mind while you are working.

1. First of all, I want you to end up with one big picture. It has to be a whole design that you will make together; and you should know what it is you are making together. The design should be interesting, with lots of different things in it.

2. Secondly, the design should be balanced.
   Probe: Do you know what balanced means?
   Like a scale, even; complementing.
   Probe: How can you make it balanced?
   See that there isn't a pile of pieces in one third, and other third is empty; count approximately same number of pieces. Doesn't need to be the same design, just even.

3. Thirdly, the design should be unified.
   Probe: Do you know what unified means?
   United.. hang together.. related.
   Probe: How can you make it unified?
   Connecting separate parts, make a border.

You can work on your design any way you want to.

As I've said before, each one of you is responsible for one third of the picture. But you don't have to work on your own part. You can work on other parts as well, because, after all, your group has to come out with one whole big picture.

This isn't a test, so you can talk as much as you want to, move around any way you want to... [For group process, add: in fact, you'll have to remember what we've said about how you should go about working together]

When you are finished we are going to stand the board up and we won't want the pieces to fall off. So don't stand them on their edges or pile them up. Put each piece down so it sticks to the board.

Before we begin I'd like to know if you all want to try this. You don't have to stay here. You can go back to your classroom and that's perfectly all right. Let's see who wants to stay. Good.

Any questions? #1 - is all this clear? Now is your time to ask because remember, once you start you won't be able to ask questions. Repeat for #2 and #3.

O.K. You can talk together as much as you want to while you work. Begin. [For group process: in fact, as we've said, you need to discuss things with each other.]

(Answers to questions should re=phrase instructions, without giving how-to-do instructions; no new information should be added. If asked, respond: this is up to you and your group. You can do it any way you wish.)

APPENDIX C-4

Instructions for Task Roles

Now that you've gotten the idea of how this works, let me just help you along a little bit.

There are quite a few things for each of you to remember, so let's try and make each of you a special helper to the group, so each of you has to be responsible for remembering only one special thing.

#1 - why don't you be the designer

Probe: what do you suppose the Designer can do to help?
plan one big picture,
all should know what you are making
should have many different interesting things in it.

#2 - how would you like to be the balancer?

Probe: what do you think the Balancer can do to help?
parts should be even,
help count approximately same number of pieces
in each part

#3 - there is one more thing to remember and you can be just of as much help as the others, do you know what it is? Unifier.

Probe: what do you think the Unifier does?
connect parts, by border.

This way, while you each put pieces down to contribute to one big picture, you also each can help in a special way by having a special responsibility as a designer - a balancer - a unifier.

APPENDIX C-5

Instructions for Group Roles

1. In a little while, you'll all be working together. Do you ever work in groups on a project in your classroom? What kinds of things do you work on in groups?

2. How is working in groups different from working alone?
   Probe... make sure the following are brought out:
   more fun
   more noise (but this is good)
   benefit by each others' ideas

3. Is your work better if you work together?
   Probe... make sure it is concluded that it is better only if
   communication takes place.
   Shared ideas
   Listen to others
   Contribute own opinions
   remember this as you work, because you'll be working together, and unless you exchange ideas, pay attention to what the others are saying,
   discuss..
   give-and-take

4. Very different from usual classroom, where teacher tells you not to discuss, to work independently - here, we want you to work together.

5. Any questions? Now is your chance, because, remember, after you start we shall be invisible. #1 - any questions? How will you go about working? #2? #3?
   Instructions from now on as for all other conditions.